

Journal of Personality and Social Psychology

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Online First Publication, February 12, 2018. <http://dx.doi.org/10.1037/pspi0000127>

CITATION

McNulty, J. K., Meltzer, A. L., Makhanova, A., & Maner, J. K. (2018, February 12). Attentional and Evaluative Biases Help People Maintain Relationships by Avoiding Infidelity. *Journal of Personality and Social Psychology*. Advance online publication. <http://dx.doi.org/10.1037/pspi0000127>

Attentional and Evaluative Biases Help People Maintain Relationships by Avoiding Infidelity

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Two longitudinal studies of 233 newlywed couples suggest that automatic attentional and evaluative biases regarding attractive relationship alternatives can help people maintain relationships by avoiding infidelity. Both studies assessed participants' tendency to automatically disengage attention from photos of attractive, opposite sex individuals; one study assessed participants' tendency to devalue those individuals by comparing their attractiveness evaluations to evaluations made by single people, and both studies assessed infidelity and relationship status multiple times for approximately three years. Several sources of devaluation emerged, but only participants' history of short-term sex predicted both biases; having more short-term sexual partners was associated with being slower to disengage attention from attractive alternatives, and, among men, evaluating such individuals more positively. In turn, both processes exerted indirect effects on relationship dissolution by predicting infidelity; being 100 ms faster to disengage attention from attractive alternatives or rating them 2 scale points lower in attractiveness was associated with a decrease in the odds of infidelity of approximately 50%; the effect of devaluation on infidelity was stronger among participants who evidenced steeper declines in marital satisfaction. These associations emerged because unfaithful individuals took longer to disengage attention from attractive alternatives compared with other social targets and did not differ from singles in their evaluations of those alternatives. Among several other predictors of infidelity, partner attractiveness was associated with a decrease in the odds of infidelity among men but not women. These findings suggest a role for basic psychological processes in predicting infidelity, highlight the critical role of automatic processes in relationship functioning, and suggest novel ways to promote relationship success.

Keywords: automaticity, extrapair sex, infidelity, marriage, relationship maintenance

Long-term romantic relationships are a central component of human social life. From an evolutionary perspective, such relationships are a primary source of reproductive success (Lovejoy, 1981; Trivers, 1972). From a more proximate perspective, long-term relationship partners play a critical role in helping one another regulate their psychological resources to most effectively reach important goals, such as those relevant to career, social life, and health (Fitzsimons, Finkel, & vanDellen, 2015; Holt-Lunstad, Smith, & Layton, 2010; Proulx, Helms, & Buehler, 2007; Robles, Slatcher, Trombello, & McGinn, 2014). For example, several meta-analyses demonstrate that quality relationships are an important and reliable predictor of better mental and physical health (Holt-Lunstad et al., 2010; Proulx et al., 2007; Robles et al., 2014). In fact, whereas relationship dissolution poses significant health risks (Liu & Umberson, 2008), simply being married reduces mortality risk (House, Landis, & Umberson, 1988).

But maintaining a long-term relationship is difficult. In numerous industrialized countries, for example, dissolution rates for marriage, one of the most committed relationships, hover between 30% and 50% (Amato & James, 2010; Schoen & Canudas-Romo, 2006). According to interdependence theory (Kelley & Thibaut, 1978), the primary theoretical model explaining relationship dissolution, there are at least two independent predictors of commitment to a relationship—satisfaction with the relationship and alternatives to the relationship (for evidence that investments are a third independent predictor of commitment, see Rusbult, 1980). Indeed, not only are both relationship satisfaction (Karney & Bradbury, 1995) and engaging in sexual relations with alternative partners (Fincham & May, 2017) reliably linked to relationship dissolution, these factors exert independent effects (Hall & Fincham, 2006; Previti & Amato, 2004). In fact, infidelity has been implicated as the most common predictor of relationship dissolution across 160 societies (see Betzig, 1989, as cited in Fincham & May, 2017). Nevertheless, whereas relationship scientists have amassed a voluminous literature on the psychological processes that help people maintain relationship satisfaction (see Bradbury, Fincham, & Beach, 2000; Finkel, Simpson, & Eastwick, 2017; Karney & Bradbury, 1995; McNulty, 2016), we know far less about the psychological processes that independently help minimize infidelity.

Existing research suggests two basic psychological processes may help minimize the risk of infidelity: (a) automatic attentional biases that direct attention away from attractive relationship alter-

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natives (e.g., Maner, Gailliot, & Miller, 2009; see also, Miller, 1997) and (b) evaluative biases that devalue the attractiveness of such alternatives (e.g., Lydon, Meana, Sepinwall, Richards, & Mayman, 1999; Johnson & Rusbult, 1989; Simpson, Gangestad, & Lerma, 1990). In an initial investigation of attentional biases, Miller (1997) asked members of dating relationships to report how frequently they attended to alternative partners and then to view images of attractive members of the opposite sex in the laboratory. Participants' reports of attention to alternatives were positively associated with the time they spent attending to attractive targets in the laboratory and both measures of attention were associated with being less committed to the relationship. Further, participants who reported spending less time attending to alternatives were less likely to have dissolved their relationship two months later. Consistent with the presumed functionality of this process, subsequent research demonstrates that the tendency for people to disengage their attention from relationship alternatives (a) is specific to relationship alternatives who are highly attractive (Maner et al., 2009), (b) is activated by relationship-maintenance motives (Linardatos & Lydon, 2011; Maner, Rouby, & Gonzaga, 2008), and (c) occurs automatically (Maner, Gailliot, Rouby, & Miller, 2007).

Of course, it is inevitable that people will at times need to attend to at least some attractive relationship alternatives, such as classmates, work colleagues, or members of the same social group. When committed people do attend to attractive alternatives, they appear to employ the other presumed relationship-maintenance strategy: they devalue the physical attractiveness of those alternatives (Johnson & Rusbult, 1989; Lydon, Fitzsimons, & Naidoo, 2003; Lydon et al., 1999; Ritter, Karremans, & van Schie, 2010; Simpson et al., 1990). In an initial demonstration of this evaluative bias, Johnson and Rusbult (1989) asked members of dating relationships to evaluate the rewards (e.g., physical appearance) and costs of their relationship alternatives in a baseline assessment and then again seven months later. The tendency to devalue the alternatives over time was associated with a greater probability of remaining in the relationship. Consistent with the presumed functionality of this mechanism, subsequent work demonstrates that the devaluation of attractive alternatives is particularly likely to occur under conditions of relationship threat (Johnson & Rusbult, 1989; Lydon et al., 1999), extends specifically to ratings of physical attractiveness (Lydon et al., 1999), and has automatic properties (Cole, Trope, & Balcells, 2016), even when measured explicitly (Karremans, Dotsch, & Corneille, 2011; Karremans & Verwijmeren, 2008).

Yet, despite this evidence that committed people tend to disengage their attention from and devalue attractive alternatives, we are aware of no research that has examined whether either bias actually predicts a decreased probability of infidelity or relationship dissolution. Instead, most studies involving these processes have examined the sources of these biases, such as commitment (Maner et al., 2009; Miller, 1997; Lydon et al., 1999; Lydon et al., 2003), relationship motives (Linardatos & Lydon, 2011), and sexual motives (Maner, Gailliot, & DeWall, 2007). Further, the literature on infidelity has focused mostly on distal predictors of infidelity, such as demographic variables (e.g., age, race), personality traits (e.g., attachment insecurity, narcissistic qualities), and general qualities of the relationship (e.g., relationship satisfaction and commitment; Altgelt, Reyes, French, Meltzer, & McNulty, 2017; Atkins, Baucom, & Jacobson, 2001; Buss & Shackelford, 1997;

McNulty & Widman, 2014; Russell, Baker, & McNulty, 2013; Treas & Giesen, 2000; for reviews, see Blow & Hartnett, 2005; Fincham & May, 2017). Accordingly, although that literature offers important insights into who is most at risk for engaging in infidelity, it provides little information regarding the specific psychological processes that contribute to or minimize infidelity, which is crucial to supporting and extending existing theoretical perspectives of relationship maintenance (e.g., Karney & Bradbury, 1995; Lydon & Karremans, 2015; Rusbult, Olsen, Davis, & Hannon, 2001). The current studies tested the hypothesis that tendencies to disengage attention from and devalue attractive romantic alternatives help decrease the likelihood of infidelity and thereby maintain long-term relationships.

Predictors of Attentional Disengagement From and Devaluation of Attractive Alternatives

Of course, providing the most complete understanding of relationship-maintenance processes requires situating them within the broader context of individuals and their relationships (see McNulty, 2016). Accordingly, in addition to examining the effects of attention to and devaluation of alternatives on infidelity and relationship dissolution, we also considered factors that might promote each bias—that is, their potential antecedents. We considered both relational and individual-level variables.

Relational Variables

From a relational perspective, the most obvious candidate, and one that may be a source of both maintenance processes, is commitment. As noted, prior research has already provided some evidence that people who are more committed to their relationships, either structurally or psychologically, engage in each process (Lydon et al., 1999, 2003; Maner et al., 2009; Miller, 1997), and commitment has been implicated as a predictor of infidelity (Drigotas, Safstrom, & Gentilia, 1999). Nevertheless, there is some reason to question whether such associations should emerge in new marriages. Most notably, in support of their commitment-calibration hypothesis, Lydon et al. (1999) demonstrated that people only devalue alternatives when those alternatives provide enough threat to rival their existing levels of commitment. In their research, participants who were moderately committed (vs. high or low in commitment) were more likely to devalue alternatives who were only moderately threatening (i.e., seeking a relationship); however, participants who were high in commitment (vs. low in commitment or moderately committed) were more likely to devalue alternatives when those alternatives were highly threatening (i.e., seeking a relationship *and* attracted to the participant). In other words, the effects of commitment on (at least) the tendency to devalue attractive alternatives may not be a straightforward linear association among married individuals but may instead depend on moderating variables such as their levels of threat.

In addition to commitment, we also considered three other relational variables as predictors of each process—relationship satisfaction, sexual satisfaction, and partner physical attractiveness. With respect to relationship satisfaction, overall evaluations of a relationship are theorized to motivate numerous relationship-maintenance processes (Fletcher & Kerr, 2010; Karney & Bradbury, 1995). From this perspective, people are more motivated to

maintain and protect satisfying relationships than to protect less satisfying ones. Consistent with this possibility, relationship satisfaction is cross-sectionally associated with numerous relationship-maintenance processes, such as forgiveness (Allemand, Amberg, Zimprich, & Fincham, 2007), positive partner illusions (Murray, Holmes, & Griffin, 1996), benevolent attributions (Bradbury & Fincham, 1990), and constructive problem solving (McNulty & Russell, 2010). Further, and by contrast, relationship dissatisfaction has been implicated in infidelity (Blow & Hartnett, 2005; Fincham & May, 2017). The association between relationship dissatisfaction and infidelity may occur because relationship satisfaction motivates attentional disengagement from and devaluation of attractive alternatives.

Given that these processes may help maintain relationships by protecting against sexual infidelity in particular, any role of evaluative biases that protect against alternatives may be specific to sex. That is, people who experience low sexual satisfaction in their current relationships may be particularly susceptible to the allure of attractive alternative partners. Indeed, low sexual satisfaction has been implicated in infidelity (Buss & Shackelford, 1997; Liu, 2000). The association between sexual dissatisfaction and infidelity may occur because sexual satisfaction motivates attentional disengagement from and devaluation of attractive alternatives.

Finally, with respect to partner physical attractiveness, each maintenance process is conceptualized as protecting the relationship from alternatives who are physically attractive, and the level of physical attractiveness of such alternatives appears to account for at least some of their threat (see Johnson & Rusbult, 1989; Maner et al., 2007). Accordingly, we reasoned that the partner's physical attractiveness may be a relevant factor as well. Similar to the idea that commitment to a relationship can minimize the threat associated with a particular alternative (Lydon et al., 1999), having an attractive partner may minimize the threat posed by attractive alternatives, which may reduce either bias. Of course, given that partner physical attractiveness appears to be particularly important to men (see Li et al., 2013; Meltzer, McNulty, Jackson, & Karney, 2014a; Meltzer, McNulty, Jackson, & Karney, 2014b), any associations involving partner attractiveness may be stronger among men.

Individual-Level Variables as Predictors

We also considered four individual-level variables that may predict each process—attachment insecurity, a history of more frequent short-term sexual relationships, self-reported interest in alternatives, and self-control. Attachment security is an individual difference variable that captures people's tendencies toward viewing and relating to close others (see Mikulincer & Shaver, 2007). Whereas individuals high in attachment anxiety cope with threats by becoming hypervigilant to signs of abandonment and seeking support from close others in eager and sometimes confrontational ways, individuals high in attachment avoidance cope with threats by withdrawing from close others and seeking minimal support. These individual differences in attachment security are related to differences in how people respond to and approach sexual situations and experiences (Birbaum, Reis, Mikulincer, Gillath, & Orpaz, 2006; Davis, Shaver, & Vernon, 2004; Del Giudice, 2009). Of particular relevance, Davis et al. (2004) demonstrated that both forms of attachment insecurity are associated with numerous mo-

tivations for sex, and sometimes in opposite directions. For example, although both forms of insecurity were associated with increased motivations to engage in sex to relieve stress, only attachment avoidance was associated with the motivation to engage in sex for physical pleasure. Further, whereas attachment anxiety was associated with an increased motivation to engage in sex to increase closeness, attachment avoidance was associated with a decreased motivation to engage in sex for this reason. These and other differences between secure and insecure intimates' motivation for sex may manifest as basic cognitive tendencies such as the attentional and evaluative biases examined here. Consistent with these ideas, DeWall et al. (2011) demonstrated that people higher in attachment avoidance took longer to disengage their attention from attractive alternatives. Nevertheless, other research has questioned whether such tendencies should emerge among married individuals by showing that individuals high in attachment avoidance are no more likely to engage in marital infidelity than those low in attachment avoidance (Russell et al., 2013).

We also considered the role of individual differences that are specific to sexual motives—that is, sociosexual orientation (Simpson & Gangestad, 1991). Whereas people with an unrestricted sociosexual orientation are comfortable with and more likely to pursue short-term sexual encounters (i.e., sexual encounters in the absence of commitment), people with a more restricted orientation are less interested in short-term sexual encounters and prefer higher levels of commitment prior to engaging in sex. Not surprisingly, sociosexuality has been implicated as a risk factor for infidelity (Barta & Kiene, 2005). Accordingly, people with a history of more (vs. less) short-term sexual relationships may be biased toward attending more to attractive alternatives and being less likely to devalue their attractiveness. Consistent with this possibility, Maner, Gailliot, and Dewall (2007) demonstrated that, among men, having a more unrestricted sociosexual orientation was associated with being slower to disengage attention from attractive members of the opposite sex.

Relatedly, we also examined people's self-reported interest in alternative partners, which, given it is self-reported, requires some amount of cognitive deliberation (see Fazio & Olson, 2014). There is mixed evidence regarding whether people are willing and able to report on their automatic cognitive processes after engaging in such deliberation (see Newell & Shanks, 2014). Given the automatic qualities of both maintenance processes (Cole et al., 2016; Karremans et al., 2011; Karremans & Verwijmeren, 2008; Maner et al., 2008), it is informative to examine whether either bias is associated with people's self-reported interest in alternatives. Given that devaluing alternatives may also require at least some deliberation whereas automatic attentional disengagement may not, devaluation may be more likely to be associated with self-reported interest in alternatives.

Finally, we also considered people's abilities to control their impulses—that is, individual differences in self-control (see de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012). Although there is some evidence that each process has automatic properties, individual differences in the ability to control one's behavior may offer the resources necessary to either supplement or override these inclinations, particularly to the extent that they involve any deliberation. Although attentional disengagement, at least as it is typically measured (e.g., Maner et al., 2007), operates so quickly that it may elude conscious control, devaluing alterna-

tives requires some deliberation, which may allow for the influence of self-control. Notably, low self-control has been implicated as a risk factor for engaging in infidelity (McIntyre, Barlow, & Hayward, 2015).

Overview of the Current Research

We drew from two longitudinal studies of 233 new marriages that employed standard measures of attentional disengagement from and devaluation of attractive relationship alternatives. At baseline in both studies, we assessed the extent to which intimates were able to quickly disengage their attention from attractive opposite sex targets (see Maner et al., 2009); at baseline in Study 1, we additionally assessed the extent to which intimates devalued the attractiveness of opposite sex targets relative to a sample of same-sex single people (see Simpson et al., 1990). At baseline in both studies, we assessed numerous potential predictors of each process and infidelity. Also at baseline in both studies, and then again every six months for three and a half years in Study 1 and annually for three years in Study 2, we assessed whether intimates engaged in an infidelity. Finally, every six months for three and a half years in Study 1 and every four months for three years in Study 2, we additionally assessed marital satisfaction, commitment, and whether the relationship had dissolved. Given the parallel designs of the studies, we describe them simultaneously and collapse across the two in all analyses involving attentional disengagement (the process assessed in both studies). In all analyses that collapsed across study, we controlled for idiosyncratic differences between the studies using a dummy code (Study 1 = 0, Study 2 = 1) and examined whether key effects differed statistically across the studies.

Method

Participants

Participants in Study 1 were 224 members of 113 heterosexual couples who properly completed all relevant measures at baseline of a longitudinal study of newlywed couples conducted in northern Texas. Participants in Study 2 were 236 members of 120 couples ($n = 119$ heterosexual, $n = 1$ lesbian) who properly completed all relevant measures at baseline of a longitudinal study of newlywed couples conducted in northern Florida. Three of the six participants not included (two husbands in Study 1, one wife in Study 2) experienced equipment failure that prevented assessing the attention and devaluation data; the other three participants not included in analyses (one husband and two wives in Study 2) demonstrated extreme scores on the attention measure and were excluded a priori from those analyses (see description of this measure for more information). Thus, all primary analyses that used data from both studies were based on a total of 460 members of 233 couples and primary analyses that used only data from Study 1 were based on 224 members of 113 heterosexual couples.

Participants in both studies were recruited via letters sent to couples who had recently applied for marriage licenses. In Study 2, we additionally recruited couples using fliers and Facebook advertising. As part of the broader goals of the studies, eligibility required that all participants (a) had been married for fewer than four months in Study 1 and three months in Study 2, (b) were at

least 18 years of age, and (c) spoke English (to ensure comprehension of questionnaires). Given broader aims of Study 1, that study included the additional criterion that both members of the couples were in their first marriages.

On average, husbands were 29.97 ($SD = 7.78$) years of age and wives were 28.32 ($SD = 6.64$) years of age. The median self-reported income was \$31K for husbands and \$27K for wives. Approximately 63% of husbands and wives self-identified as Caucasian; the remaining participants were mostly African American (20% of husbands and 18% of wives) and Latino/a (9% of husbands and 11% of wives). Approximately 25% of the couples reported having children. Additional details of each sample are provided elsewhere (Meltzer, Makhanova, Hicks, French, McNulty, & Bradbury, 2017).

Procedure

After enrolling in each study, spouses were either mailed a packet of surveys to complete at home and bring with them to a laboratory session or e-mailed a link to Qualtrics.com where they completed surveys online prior to their laboratory session. These surveys included a consent form approved by the local human-subjects review board, questions assessing their own and their partners' infidelity, potential predictors of each process and covariates, including marital satisfaction and commitment, additional measures beyond the scope of these analyses, and instructions requesting that spouses complete the measures independently of one another. At their laboratory session, spouses in both studies completed the attention measure and spouses in Study 1 completed the devaluation measure; all spouses additionally completed a variety of tasks beyond the scope of the current analyses. Couples were compensated \$100 for completing the surveys and session.

Approximately every six months (Study 1) or four months (Study 2) subsequent to their initial laboratory session, spouses were contacted by phone or e-mail and again sent a packet of survey questionnaires (via e-mailed link or mail). Participants in Study 1 were asked to answer the same questions assessing infidelity, marital satisfaction, and commitment or reported that the relationship had dissolved (i.e., they had divorced or separated) at each follow-up assessment. Participants in Study 2 reported their relationship status, marital satisfaction, and commitment at every follow-up assessment and their own and their partner's infidelity at the 1- and 2-year follow-up assessments. Follow-up assessments spanned three and a half years in Study 1 and three years in Study 2. At least one member of 83 (73%) couples in Study 1 and both members of 109 (91%) couples in Study 2 provided responses to at least one of these follow-up assessments. Couples received a check (\$30 in Study 1; \$25 in Study 2) for completing each follow-up assessment. The minor differences in procedures used across the studies were due to broader aims of each study and constraints on each investigator.

Measures

Attention to alternatives. To assess participants' attention to attractive relationship alternatives, we used a dot probe procedure developed and used in prior research (Maner et al., 2007). This procedure operationalizes attentional disengagement by measuring the time participants take to shift their attention away from four

types of targets: (a) highly attractive men, (b) highly attractive women, (c) average-looking men, and (d) average-looking women. We included 10 targets from each target category and thus all participants viewed a total of 40 color facial photographs. All photographs were pretested by an independent group of undergraduate students (see Maner et al., 2007).

The procedure included 3 experimental blocks, each involving 20 trials. For these, each trial was as follows: First, a fixation point appeared in the center of the computer screen for 1000 ms. Next, a target face was displayed in one quadrant of the screen (e.g., upper left, lower right) for 500 ms. 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 a different quadrant (attentional-shift trials). Each participant was tasked with categorizing the object as a circle or square by pressing the appropriate key on the keyboard. Participants were instructed to respond as quickly and accurately as possible. On attentional-shift trials, participants were required to disengage their attention from the location of the target face to a different point on the screen, which makes these the trials of interest. On these trials, the response latency between the appearance of the object and the participant's response provided a measure of attentional disengagement, such that higher response times indicate that it took the participant longer to disengage his or her attention from the relevant target. Once the participant categorized the object, a 2000-ms break occurred before the next trial.

Participants completed a block of 20 practice trials involving neutral objects (e.g., household furniture) before the 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. The average time in ms it took participants to respond after shifting their attention from the four types of targets served as measures of attentional disengagement, where separate indices of attention to attractive and average-looking members of the same sex and opposite sex were calculated (the same- and opposite sex indices were switched for the two members of the one lesbian couple in Study 2); thus, higher scores indicate *less* attentional disengagement. Following Maner et al. (2007), we excluded all trials (2–3%) on which participants incorrectly categorized the object stimulus. Also following Maner et al. (2007), we excluded people on the index assessing attentional disengagement from attractive alternatives if their average response latency was 3 *SDs* above the sample mean ($n = 5$). Although this normalized the distribution for the key predictor, a few extreme values (e.g., values >8 *SDs*) remained on the indices that assessed attention to the other targets. These variables served as covariates in all analyses to account for individual differences in response time (see Zhang, Maner, Xu, & Zheng, 2017); so, rather than exclude additional participants because of extreme scores on these covariates, we trimmed the extreme scores so that they were only 3 *SDs* above the mean. Notably, couple members' tendencies to disengage their attention from attractive alternatives were not significantly correlated with one another, controlling for their tendencies to disengage their attention from the other social stimuli, $r_{\text{partial}} = -.11, p = .120$.

Devaluation of alternatives. Participants in Study 1 also completed a measure of their tendency to devalue the attractiveness of physically attractive alternatives. Participants rated 16 of the target images used in the attention task (4 targets from each

category), using a Likert-type scale ranging from 1 = "not at all attractive" to 10 = "extremely attractive," that were also evaluated by an independent sample of single men ($n = 36$) and single women ($n = 30$). We used the eight attractive photos to create an index of devaluation, given the relatively higher levels of threat posed by such alternatives (Johnson & Rusbult, 1989). The single men perceived that the attractive target women were 25.28 ($SD = 3.42$) years of age and the single women perceived that the attractive target men were 30.12 ($SD = 3.66$) years of age. Both the single and partnered men and women rated the attractive individuals as relatively attractive (for single men, $M = 7.81, SD = 1.05$; for single women, $M = 6.75, SD = 1.63$; for partnered men, $M = 7.19, SD = 1.71$; for partnered women, $M = 5.91, SD = 1.97$). Consistent with the robust body of research showing that committed people tend to devalue the attractiveness of alternatives compared with single individuals (Lydon et al., 1999), the partnered individuals evaluated the individuals as less attractive: for men, $t(145) = 2.05, p = .042$; for women, $t(139) = 2.09, p = .038$. Because we were interested in the downstream implications of individual differences in this tendency, we subtracted the mean ratings of the attractive photographs made by the opposite sex single individuals from participants' mean ratings of those same opposite sex photographs to form a measure of devaluation. Positive numbers indicate a tendency to rate the photos as more attractive than did the sample of single individuals whereas negative numbers indicate a tendency to rate the photos as less attractive than did the sample of single individuals; thus higher scores indicate *less* devaluation. Given our interest in the devaluation of attractive targets regardless of their general evaluative tendencies, we controlled for participants' evaluation of all other targets in all analyses examining devaluation of attractive relationship alternatives. Using such a comparison group to assess the presence of devaluation is a common practice (Simpson et al., 1990). Couple members' tendencies to devalue the attractiveness of attractive alternatives were not significantly correlated with one another, controlling for their evaluations of the other faces, $r_{\text{partial}} = .02, p = .882$.

Infidelity. At baseline, and then again at each follow-up assessment in Study 1 and at each annual assessment in Study 2, both members of each couple reported on their own and their partner's infidelity. Specifically, each participant in Study 1 answered the questions, "Have you had sexual relations with anyone other than your spouse over the past six months," and "Has your spouse had sexual relations with anyone other than you over the past six months." Participants in Study 2 reported whether they "had a romantic affair/infidelity" and "learned that spouse had a romantic affair/infidelity." In both studies, our primary operationalization of infidelity was a dummy code indicating whether either partner reported that a particular participant (actor) engaged in an infidelity over the course of the study (0 = *no infidelity*, 1 = *infidelity*). According to this operationalization, a total of 37 (8%) individuals engaged in an infidelity (in Study 1, $n = 14$; in Study 2, $n = 23$). Given motivations of both partners to avoid reporting information that suggests negative qualities (see DeMaio, 1984; Tourangeau & Yan, 2007), we chose this as our primary operationalization because we assumed there was more signal than noise in each person's report of infidelity and that this way of capturing infidelity would be most inclusive. Nevertheless, we also followed up on these primary analyses with analyses based on two more-conservative estimates of infidelity: one that was based on only

actors' reports of their own infidelity and a second that was based on only the cases in which both partners reported an actor's infidelity; actors reported a total of 24 infidelities (in Study 1, $n = 10$; in Study 2, $n = 14$); both partners agreed on only 13 infidelities (in Study 1, $n = 6$; in Study 2, $n = 7$). As noted by Fincham and May (p. 73), methodological inconsistencies such as these are "understandable in researching a phenomenon that is rooted in deceit and thus inimical to the truth that science seeks to illuminate." Results replicated across all measures with one exception.

Relationship dissolution. At each follow-up assessment in both studies, we assessed whether the couple had divorced or separated indefinitely. We formed a dummy code to indicate whether the relationship had dissolved (0 = *still together*, 1 = *dissolved*). A total of 28 (12%) couples reported separating or divorcing (in Study 1, $n = 15$; in Study 2, $n = 13$).

Additional predictors and covariates. We also assessed several additional variables that we tested as predictors of the relationship-maintenance processes and/or used as covariates when predicting the maintenance processes and infidelity. Regarding predictors of the relationship-maintenance processes, we assessed marital satisfaction, commitment, sexual satisfaction, attachment insecurity, self-reported interest in alternatives, number of prior short-term sexual relationships (as a proxy for sociosexual orientation), self-control, and objective ratings of partners' facial attractiveness. Regarding covariates, we additionally assessed own and partner age, objective ratings of own attractiveness, and the self-reported availability of romantic alternatives.

Marital satisfaction. Participants reported their global levels of marital satisfaction at baseline and each follow-up assessment using the Quality Marriage Index (Norton, 1983), which contains five items that ask participants the extent to which they agree or disagree with general statements about their marriage (e.g., "We have a good relationship") on a scale from 1 = *very strong disagreement* to 7 = *very strong agreement*, and one item that asks spouses to answer the question "All things considered, how happy are you with your marriage?" on a scale from 1 = *very unhappy* to 10 = *perfectly happy*. Thus, total scores could range from 6 to 45, with higher scores indicating higher marital satisfaction. Internal consistency of this measure was adequate (in both studies, $\alpha \geq .90$ at all assessments). Satisfaction at baseline was high in both studies (in Study 1, $M = 42.23$, $SD = 4.27$; in Study 2, $M = 41.33$, $SD = 4.77$). We examined marital satisfaction and changes in marital satisfaction as a (a) covariate, to ensure effects were not driven by satisfaction, (b) moderator, to explore whether certain effects were stronger among those who were more or less satisfied, and (c) potential dependent variable, to explore whether the attentional and evaluative mechanisms led to higher levels of marital satisfaction.

Commitment. Participants reported their commitment to the relationship at baseline and each follow-up assessment using the commitment subscale of Investment Model Scale (Rusbult, Martz, & Agnew, 1998), which contains seven items with which participants indicate their level of agreement (e.g., "I am committed to maintaining my relationship with my partner"). In Study 1, participants responded to each item using a 4-point scale, where 1 = *don't agree at all* and 4 = *agree completely*; in Study 2, participants responded to each item using a 9-point scale, where 1 = *do not agree at all* and 9 = *agree completely*. Appropriate items were reversed and all items were averaged so that high scores indicated

greater commitment. Due to scoring differences across the studies, we standardized this scale within each study. Internal consistency of this measure was somewhat low at baseline in both studies, but otherwise adequate (in Study 1, coefficient alpha was $.64$ at baseline and $\geq .70$ at all follow-up assessments; in Study 2, coefficient alpha was $.71$ at baseline and $\geq .80$ at all follow-up assessments). Commitment was high at baseline in both studies (in Study 1, $M = 3.87$, $SD = 0.30$; in Study 2, $M = 8.71$, $SD = 0.70$). As with marital satisfaction, we examined commitment and/or changes in commitment as a (a) covariate (b) moderator, and (c) potential dependent variable.

Sexual satisfaction. Participants reported their sexual satisfaction at baseline using the Index of Sexual Satisfaction (Hudson, 1998), which contains 25 items with which participants indicate their level of agreement on a scale from 1 = *none of the time* to 7 = *all of the time* (e.g., "I think that our sex is wonderful"). Responses to these items were reversed when appropriate and summed to form scores that ranged from 25 to 175, with higher scores indicating higher levels of sexual satisfaction. Internal consistency of this measure was high in both studies (in Study 1, $\alpha = .92$; in Study 2 $\alpha = .93$).

Attachment insecurity. Participants reported their levels of attachment insecurity using the Experiences in Close Relationships Scale—Revised (ECR-R; Fraley, Waller, & Brennan, 2000). The ECR-R is a continuous measure of attachment insecurity that identifies the extent to which a person is characterized by two dimensions: attachment anxiety and attachment avoidance. The Attachment Anxiety subscale is comprised of 18 statements that describe the degree of concern intimates have about losing or being unable to become sufficiently close to a partner and the Attachment Avoidance subscale is comprised of 18 statements that describe the extent to which partners attempt to maintain distance from a partner. Participants were asked to rate how much they agreed or disagreed with these statements using a scale from 1 = *disagree strongly* to 7 = *agree strongly*. Appropriate items were reversed and all items were averaged, with higher scores indicating greater attachment insecurity. Internal consistency was high in both studies (in Study 1, $\alpha = .94$ for anxiety and $\alpha = .93$ for avoidance; in Study 2, $\alpha = .92$ for anxiety and $\alpha = .93$ for avoidance).

Number of prior short-term sexual relationships. Participants provided a numerical estimate of the number of times they had engaged in sex on one and only one occasion using an item contained on Simpson and Gangestad's (1991) original Sociosexual Orientation Inventory (SOI) and Penke and Asendorpf's (2008) revised SOI. The specific item read: "With how many different partners have you had sexual intercourse on *one and only one* occasion?" (In Study 1, this question began with the phrase "Prior to marriage.") Given the high level of skew on this item, we followed Penke and Asendorpf's (2008) suggestion for recoding participants' responses using the following scale: (0 = 1, 1 = 2, 2 = 3, 3 = 4, 4 = 5, 5–6 = 6, 7–9 = 7, 10–19 = 8, 20+ = 9).

Explicit interest in relationship alternatives. Participants reported their explicit interest in having sexual relations with alternative partners using the Alternative Monitoring subscale of the Commitment Inventory (Stanley & Markman, 1992), which contains six items with which participants state their level of agreement using a scale from 1 = *strongly disagree* to 5 = *strongly agree* (e.g., "Though I would not want to end the relationship with

my partner, I would like to have a romantic/sexual relationship with someone other than my partner”). Higher scores indicate a greater desire to engage in sexual relations with alternative partners. Internal consistency was adequate in both studies ($\alpha = .73$).

Trait self-control. Participants reported their levels of trait self-control using the brief version of the Self-Control Scale (Tangney, Baumeister, & Boone, 2004), which asks participants to rate their level of agreement with 13 items using a scale from 1 = *not at all agree* to 5 = *strongly agree* (e.g., “I am good at resisting temptation”). Appropriate items were reversed such that higher scores indicated higher self-control, and all items were averaged. Internal consistency was adequate (in Study 1, $\alpha = .83$; in Study 2, $\alpha = .86$).

Facial attractiveness. We used photographs taken of participants during their laboratory session to code their facial attractiveness. For each study, a group of independent research assistants (Study 1, $n = 5$; Study 2, $n = 4$), who were trained to attend to phenotypic features of participants’ faces (rather than clothing, hair style, etc.), rated each participant’s facial attractiveness using a 10-point scale, where higher ratings indicate more physically attractive faces. Our coders demonstrated adequate levels of agreement [in Study 1: Intraclass Correlation Coefficient (ICC) = .82 for husbands, $ICC = .92$ for wives; in Study 2: $ICC = .84$ for husbands, $ICC = .86$ for wives].

Availability of alternative relationship partners. Participants reported the availability of alternative partners using the Availability of Partners subscale of the Commitment Inventory (Stanley & Markman, 1992). This subscale contains six statements with which participants rate their level of agreement using a scale from 1 = *strongly disagree* to 5 = *strongly agree*. Higher scores indicate the presence of more alternatives (e.g., “I believe there are many people who would be happy with me as their spouse or partner”). Internal consistency was adequate (in Study 1, $\alpha = .69$; in Study 2, $\alpha = .80$).

Age. Finally, participants indicated their age in years.

Results

What Predicts Attentional Disengagement From and Devaluation of Attractive Alternatives?

What predicts attentional disengagement? To ease interpretation of effects, all variables except the dummy codes for participant sex and study were standardized prior to all analyses. Our first goal was to examine predictors of people’s tendencies to disengage their attention from attractive alternatives. To address this goal, we estimated a multilevel model with individuals nested within dyads that regressed the index of attentional disengagement (i.e., the time participants took to disengage their attention from the attractive targets, where higher scores indicate *less* disengagement) onto the following variables at Level 1: the time it took to disengage attention from the other three types of targets, participant sex, initial marital satisfaction and commitment, sexual satisfaction, explicit interest in alternatives, availability of alternatives, self-control, attachment anxiety, attachment avoidance, number of prior short-term sexual partners, own and partner age, and own and partner facial attractiveness. We also controlled for study with a dummy code (0 = Study 1, 1 = Study 2) at Level 2.

Results of this analysis are reported in Table 1. Aside from attention to the other social stimuli, only the number of prior short-term sexual partners was associated with attentional disengagement from attractive opposite sex alternatives; people who reported more prior short-term sexual partners took longer to disengage their attention from the attractive alternatives. This effect was not moderated by participant sex, $\beta = 0.03$, $SE = 0.04$, $t(206) = 0.67$, $p = .502$, and it did not differ across the two studies $\beta = 0.01$, $SE = 0.04$, $t(206) = 0.15$, $p = .882$. No other predictors emerged as significant or were moderated by participant sex.¹

What predicts devaluation? A multilevel model indicated that the speed with which people disengaged their attention from attractive alternatives was not significantly correlated with the extent to which they devalued those alternatives in Study 1, controlling for attentional disengagement from and evaluations of the other stimuli, $r = -.00$, $p = .934$, suggesting that these two measures capture different psychological processes. Thus, we next examined predictors of the tendency to devalue attractive alternatives in that study. To do so, we repeated the analysis described above except this time regressed the index of participants’ tendencies to devalue attractive targets (the difference between participants’ ratings of the attractive, opposite sex targets and the ratings of those same targets made by single individuals, where higher scores indicate *less* devaluation) onto the same predictors described above except we controlled ratings of the other three categories (rather than attention to them) and did not control study (because the data came only from Study 1).

Results of this analysis are reported in Table 2. Self-control, age, and partner attractiveness emerged as significant positive predictors of evaluations of attractive alternatives that did not differ across sex, indicating that people who were older (vs. younger), had more (vs. less) self-control, or had partners who were rated as more (vs. less) attractive rated attractive alternatives more positively. Additionally, attachment avoidance was negatively associated with evaluations of attractive alternatives, indicating that people who were lower (vs. higher) in attachment avoidance evaluated attractive alternatives more positively. Finally, self-reported interest in alternatives was surprisingly negatively associated with evaluations of attractive alternatives, suggesting that people who reported less (vs. more) interest in alternatives evaluated these particular alternatives more positively; this effect was only marginally significant, however.

Participant sex moderated three additional effects. First, participant sex moderated the association between prior number of short-term sexual partners and evaluations of attractive alternatives, such that men, but not women, who reported more prior short-term sexual partners rated attractive alternatives more positively than did individuals with fewer prior short-term sexual partners. Second, participant

¹ Given that the Commitment subscale of the Investment Model Scale (Rusbult et al., 1998) was assessed using a 4-point scale and had relatively low reliability in Study 1, we also examined whether replacing that scale with the entire Commitment Inventory (Stanley & Markman, 1992), assessed at baseline, yielded different results. It did not. Commitment was not significantly associated with attentional disengagement when continuing to control for two of its subscales (Availability of Alternatives, Interest in Alternatives), $t(208) = -1.34$, $p = .183$, and when not controlling either subscale, $t(211) = 1.05$, $p = .294$. Further, the Relationship Agenda subscale of the Commitment Inventory, an aspect of dedication commitment that indicates a long-term orientation toward the relationship, was not significantly associated with attentional disengagement, $t(209) = -1.25$, $p = .213$.

sex moderated the association between the availability of alternative partners and evaluations of attractive alternatives, such that men, but not women, who perceived a greater number of available partners rated the opposite-sexed attractive alternatives more positively than did those who perceived fewer available partners; among women, this association was negative, though only marginally significant. Finally, participant sex moderated the association between partner age and evaluations of attractive alternatives, such that men, but not women, with younger partners rated the opposite-sexed attractive alternatives more positively than did those with older partners.²

Do Attentional Disengagement From and Devaluation of Attractive Alternatives Predict Ultimate Relationship Outcomes?

Did attentional disengagement predict relationship outcomes? Our next set of analyses examined whether these two processes predicted ultimate relationship outcomes. Given the theoretical rationale laid out in the introduction, our primary goal was to test whether these processes predicted dissolution. Nevertheless, we also conducted exploratory analyses to examine whether either process predicted changes in marital satisfaction or changes in commitment, wondering whether any effects on dissolution occurred through changes in satisfaction or commitment.

We began by examining whether attentional disengagement predicted marital dissolution. Given that marital dissolution is a couple-level (Level 2) variable, we repeated a version of the 2-level analysis described in the previous section, such that we regressed attentional disengagement from attractive opposite sex targets onto disengagement from the other three stimuli and prior number of sexual partners at Level 1, as well as a dummy code for study at Level 2, but this time added relationship dissolution as a level-2 predictor. This analysis

Table 1
Factors Predicting Attention to Attractive Alternatives in Studies 1 and 2

Factor	β	SE	Effect-size <i>r</i>
Intercept	.00	.02	.01
Study	-.01	.08	.01
Participant sex	-.07	.04	.10
Marital satisfaction	.02	.02	.06
Commitment	-.01	.03	.04
Sexual satisfaction	-.00	.02	.00
Interest in alternatives	.03	.04	.05
Attachment anxiety	.02	.02	.05
Attachment avoidance	.00	.03	.01
Self-control	.02	.02	.05
Own attractiveness	.01	.02	.05
Partner attractiveness	-.00	.02	.02
Age	-.02	.06	.03
Partner age	.07	.05	.08
Availability of alternatives	.03	.02	.09
Number of short-term sex partners	.04*	.02	.15
Attention to attractive same-sex faces	.31***	.07	.31
Attention to average opposite-sex faces	.47***	.06	.44
Attention to average same-sex faces	.23***	.06	.28

Note. Higher scores indicate less attentional disengagement (i.e., greater attention). For Intercept and Study, $df = 230$; for all other effects, $df = 207$.

* $p < .05$. *** $p < .001$.

Table 2
Factors Predicting Devaluation of Attractive Alternatives in Study 1

Factor	β	SE	Effect-size <i>r</i>
Intercept	-.02	.05	.04
Participant sex	.04	.14	.03
Marital satisfaction	-.08	.05	.16
Commitment	-.01	.06	.01
Sexual satisfaction	-.04	.06	.07
Interest in alternatives	-.10 [†]	.06	.19
Attachment anxiety	.06	.06	.11
Attachment avoidance	-.13*	.06	.23
Self control	.14*	.06	.25
Own attractiveness	.05	.06	.08
Partner attractiveness	.16**	.05	.32
Age	.13*	.06	.22
Partner Age \times Sex	.27**	.10	.26
Men	-.26**	.11	.27
Women	.01	.08	.02
Availability of Alternatives \times Sex	-.32**	.11	.28
Men	.17*	.08	.25
Women	-.15 [†]	.09	.17
Number of Short-term Sex Partners \times Sex	-.33**	.12	.27
Men	.19**	.07	.26
Women	-.13	.09	.15
Evaluation of attractive same-sex face	.43***	.09	.47
Evaluation of average opposite-sex face	.42***	.07	.54
Evaluation of average same-sex face	-.06	.07	.08

Note. Higher scores indicate less devaluation (i.e., more positive evaluations). " \times Sex" indicates that the reported effect is the interaction by Participant Sex. In those cases, simple effects for men and women are also reported. For Intercept, $df = 112$; for all other effects, $df = 90$.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

estimates the cross-level association between attentional disengagement and relationship dissolution, controlling for participants' tendencies to disengage their attention from the other three stimuli and the number of their prior short-term sexual relationships. According to this analysis, attentional disengagement at baseline was positively associated with relationship dissolution, $\beta = 0.16$, $SE = 0.06$, $t(230) = 2.92$, $p = .004$, indicating that participants who took longer to disengage their attention from attractive alternatives were more likely to dissolve their marriages.

We next moved to the more exploratory analyses that tested whether attentional disengagement predicted changes in satisfaction and commitment, which required a different type of analysis. We first estimated changes in marital satisfaction with a fully random 2-level growth-curve model that regressed marital satisfaction onto separate intercept and time parameters for husbands and wives (where time was coded as months since baseline but centered such that the end of the study was 0 and the intercept represented marital satisfaction

² We also examined whether commitment was associated with devaluation of attractive alternatives when we replaced the Commitment subscale of the Investment Model Scale (Rusbult et al., 1998) with the full Commitment Inventory (Stanley & Markman, 1992). It was not. Commitment was not significantly associated with devaluation of attractive alternatives when continuing to control for availability of alternatives and interest in alternatives, $t(90) = 0.31$, $p = .758$, and when not controlling either subscale, $t(93) = -0.32$, $p = .751$. Likewise, the Relationship Agenda subscale of the Commitment Inventory was not significantly associated with devaluation of attractive alternatives, $t(90) = -0.68$, $p = .497$.

at the end of the study) at Level 1. According to this model, marital satisfaction declined significantly over time for both husbands, $\beta = -0.12$, $SE = 0.02$, $t(232) = -6.82$, $p < .001$, and wives, $\beta = -0.17$, $SE = 0.02$, $t(232) = -7.32$, $p < .001$. The declines for wives were stronger than the declines for husbands, $\chi^2 = 6.85$, $p = .009$. To examine whether attentional disengagement accounted for between-person differences in changes in marital satisfaction or marital satisfaction at the end of the study, we regressed the intercept and slope parameters from this model onto all four indices of attentional disengagement and included a dummy code for study at the intercept for each partner. To ensure that any effects were unique from prior number of sexual partners, which was identified as a source of attentional disengagement in the prior set of analyses, we additionally controlled for that variable as well. Repeated assessments were nested within individuals and all effects were pooled across husbands and wives because none significantly differed across partners. According to this analysis, the attentional disengagement index was not significantly associated with changes in marital satisfaction, $\beta = -0.03$, $SE = 0.03$, $t(218) = -0.85$, $p = .396$, or marital satisfaction at the end of the study, $\beta = -1.28$, $SE = 1.23$, $t(218) = -1.04$, $p = .298$.³

Finally, we repeated this same analysis for commitment, which, unlike marital satisfaction, was standardized within each study (given the measurement differences between the two studies). A growth curve model with no predictors indicated that commitment also declined significantly over time for both husbands, $\beta = -0.01$, $SE = 0.00$, $t(232) = -3.84$, $p < .001$, and wives, $\beta = -0.02$, $SE = 0.00$, $t(232) = -5.14$, $p < .001$. As with satisfaction, the declines for wives were stronger than the declines for husbands, $\chi^2 = 5.51$, $p = .018$. Also as was the case with satisfaction, the attentional disengagement index was not significantly associated with either changes in commitment, $\beta = -0.00$, $SE = 0.00$, $t(219) = -0.13$, $p = .900$, or commitment at the end of the study, $\beta = -0.01$, $SE = 0.18$, $t(218) = -0.09$, $p = .929$.

Did devaluation predict relationship outcomes? Next, we repeated these same analyses to assess the associations between these outcomes and devaluation of attractive alternatives in Study 1, this time controlling for evaluations of the other three types of stimuli and the sources of devaluation identified in the prior analyses (self-control, partner attractiveness, age, attachment avoidance, availability of alternatives, prior number of short-term sexual partners for men, and partner age for men) at Level 1. We again began with predicting relationship dissolution by estimated the association between devaluation of attractive alternatives and dissolution; we regressed devaluation onto evaluations of the other three types of stimuli, and the significant predictors of devaluations (self-control, partner attractiveness, age, attachment avoidance, participant sex, and interactions between participant sex and prior number of short-term sexual partners, availability of alternatives, and partner age) at Level 1 and relationship dissolution at Level 2. Devaluation trended toward being positively associated with dissolution in this analysis, $\beta = 0.18$, $SE = 0.13$, $t(111) = 1.37$, $p = .172$. We then predicted the trajectory of marital satisfaction, in the same manner as above; although the devaluation index also only trended toward being negatively associated with changes in marital satisfaction, $\beta = -0.04$, $SE = 0.02$, $t(98) = -1.57$, $p = .119$, the negative association between the devaluation index and marital satisfaction at the end of the study was marginally significant, $\beta = -1.79$, $SE = 1.04$, $t(98) = -1.72$, $p = .088$, suggesting that people who initially evaluated attractive opposite sex targets more positively were less happy at the end of the study.⁴

Finally, we predicted the trajectory of commitment in the same manner; devaluation was not meaningfully associated with changes in commitment, $\beta = -0.00$, $SE = 0.00$, $t(98) = -0.45$, $p = .647$, or commitment at the end of the study, $\beta = -0.14$, $SE = 0.13$, $t(98) = -1.06$, $p = .292$.

Do Automatic Attentional and Evaluative Biases Predict Infidelity?

Did attentional disengagement predict infidelity? We addressed our primary question by examining whether each process predicted infidelity. To estimate the association between attentional disengagement and infidelity, we estimated a 2-level model that regressed infidelity onto the time it took participants' to disengage attention from the attractive alternatives and the other three targets at Level 1 and a dummy code for study at Level 2. Given the binary nature of the dependent variable (infidelity), we specified a Bernoulli sampling distribution.

Consistent with predictions, the time participants took to disengage their attention from attractive alternatives was positively associated with infidelity, $\beta = 0.79$, $SE = 0.34$, $t(221) = 2.33$, $p = .021$, $OR = 2.21$, indicating that participants who took more time to disengage their attention from attractive, opposite sex targets at baseline were more likely to engage in an infidelity. In fact, being 1 *SD* quicker to disengage attention from attractive alternatives, which amounted to approximately 100 ms, reduced the odds of infidelity by more than 50%.⁵

We also tested whether the effects of attentional disengagement were robust to the covariates, given the rationale laid out in the

³ In an attempt to see whether attentional disengagement predicted marital dissolution independent of marital satisfaction, we conducted a supplemental analysis that additionally controlled for changes in marital satisfaction (operationalized as the empirical Bayes estimate of the slope of marital satisfaction formed in a 2-level growth-curve model with no predictors) and ending marital satisfaction (operationalized as the empirical Bayes estimate of the intercept of marital satisfaction formed in a 2-level growth-curve model with no predictors and time coded in ascending order such that the end of the study was 0) at Level 1. Attentional disengagement from attractive alternatives remained significantly associated with relationship dissolution controlling these variables as well, $\beta = 0.17$, $SE = 0.08$, $t(230) = 2.13$, $p = .034$.

⁴ Devaluation also trended toward being positively associated with dissolution in a supplemental analysis that controlled for changes in marital satisfaction and ending satisfaction (operationalized as the empirical Bayes estimates of the slope and intercept of marital satisfaction, as was done in the parallel analysis involving attentional disengagement), $\beta = 0.25$, $SE = 0.18$, $t(111) = 1.43$, $p = .156$.

⁵ A supplemental analysis revealed an Attentional Disengagement \times Study interaction that was marginally significant, $\beta = 0.41$, $SE = 0.23$, $t(220) = 1.81$, $p = .071$; nevertheless, simple effects tests indicated that the association between attentional disengagement and infidelity was significant in Study 2, $\beta = 1.03$, $SE = 0.35$, $t(220) = 2.97$, $p = .003$, and marginally significant in Study 1, $\beta = 0.62$, $SE = 0.34$, $t(220) = 1.81$, $p = .070$. A second supplemental analysis revealed the effect did not differ across men and women, $\beta = 0.28$, $SE = 0.22$, $t(219) = 1.26$, $p = .211$. Finally, a set of two additional analyses indicated that the effect was not moderated by (a) either initial marital satisfaction, $\beta = 0.08$, $SE = 0.16$, $t(217) = 0.47$, $p = .639$, or changes in marital satisfaction (operationalized as the empirical Bayes estimate of the slope of marital satisfaction formed in a 2-level, growth-curve model with no predictors), $\beta = 0.29$, $SE = 0.39$, $t(217) = .76$, $p = .450$, or (b) either initial commitment, $\beta = -0.05$, $SE = 0.16$, $t(216) = -0.29$, $p = .769$, or changes in commitment (operationalized as the empirical Bayes estimate of the slope of commitment formed in a 2-level growth-curve model with no predictors), $\beta = 0.11$, $SE = 0.09$, $t(216) = 1.21$, $p = .227$.

introduction, by adding the following variables to Level 1: participant sex, initial marital satisfaction and commitment, sexual satisfaction, explicit interest in alternatives, availability of alternatives, self-control, attachment anxiety, attachment avoidance, number of prior short-term sexual partners, own and partner age, and own and partner facial attractiveness. Results are reported in Table 3. As can be seen, the key effect remained marginally significant in Study 1 and significant in Study 2. The effect that collapsed across the studies was also significant, $\beta = 1.09$, $SE = 0.34$, $t(198) = 3.20$, $p < .001$, $OR = 2.99$.⁶

Additionally, several other independent predictors of infidelity emerged; some were robust across participant sex and the two studies whereas others emerged inconsistently across participant sex or the two studies. With respect to the predictors that were robust, marital satisfaction and partner age were negatively associated with infidelity, attachment anxiety was negatively associated with infidelity, though this association was only marginally significant, and sexual satisfaction was surprisingly positively associated with infidelity. With respect to the associations that varied across the studies, commitment was surprisingly positively associated with infidelity in Study 2, interest in alternatives was positively associated with infidelity in Study 2, and self-control was significantly negatively associated with infidelity in Study 2. With respect to the associations that varied across participant sex, partner attractiveness was negatively associated with infidelity among men whereas own attractiveness was negatively associated with infidelity among women; further, prior number of short-term sexual partners was positively associated with infidelity among men and negatively associated with infidelity among women, although both of these associations were marginally significant; finally, self-control was negatively associated with infidelity among women, although this association was also only marginally significant.

Finally, we conducted additional analyses to determine whether disengaging attention from alternatives was associated with infidelity because (a) faithful people tended to disengage their attention from attractive alternatives faster than they tended to disengage from other social stimuli, (b) unfaithful people tended to disengage their attention from attractive alternatives more slowly than they tended to disengage from other social stimuli, or (c) both. We addressed this question by regressing the raw difference between the time taken to disengage attention from attractive opposite sex targets and the average time taken to disengage from the three other stimuli onto a dummy code of infidelity, attention to the three other stimuli, and a dummy code for study. The intercept from this model represents the difference between the time taken to disengage attention from attractive opposite sex individuals and the other three social targets for people coded 0 on all variables. Thus, we centered the covariates on the sample mean and scored the infidelity variable differently for each of two different analyses—once such that 0 represented people who were unfaithful and once such that 0 represented people who were faithful. According to this analysis, faithful individuals tended to disengage their attention from attractive alternatives nonsignificantly faster than they tended to disengage from the other stimuli, $\beta = -2.48$, $SE = 1.92$, $t(231) = -1.29$, $p = .198$, whereas unfaithful individuals took significant longer to disengage their attention from attractive alternatives compared with the other stimuli, $\beta = 15.36$, $SE = 7.24$, $t(231) = 2.12$, $p = .035$.

Did devaluation predict infidelity? Next, we conducted parallel analyses to address whether participants' tendencies to de-

value attractive, opposite sex alternatives as measured in Study 1 was associated with a decreased risk of infidelity in that study. Specifically, we estimated another 2-level model that regressed infidelity onto the devaluation of attractive alternatives and evaluations of the other three stimuli. We again specified a Bernoulli sampling distribution.

Consistent with predictions, the devaluation index was positively associated with infidelity, $\beta = 0.50$, $SE = 0.25$, $t(106) = 2.00$, $p = .048$, $OR = 1.64$, indicating that participants who tended to rate the attractive, opposite sex targets more positively than did the sample of single individuals at baseline were more likely to engage in an infidelity. In fact, rating attractive alternatives 1 *SD* below the mean, which amounted to rating the target approximately 2 scale points lower on attractiveness, decreased the odds of infidelity by almost 50%.⁷ Although the effect was also not moderated by initial marital satisfaction, $\beta = -0.04$, $SE = 0.20$, $t(103) = -0.22$, $p = .825$, it was moderated by changes in satisfaction, $\beta = -0.97$, $SE = 0.33$, $t(103) = -2.90$, $p = .005$, such that the association between devaluation and infidelity was significant among who individuals who declined 1 *SD* more steeply than the sample mean, $\beta = 1.35$, $SE = 0.44$, $t(103) = 3.06$, $p = .003$, but not significant among individuals who declined 1 *SD* less steeply than the mean, $\beta = -0.58$, $SE = 0.37$, $t(103) = -1.56$, $p = .122$. See Figure 1.

We also tested whether the effects of devaluation were robust to the covariates by adding the following covariates to Level 1: participant sex, initial marital satisfaction and commitment, sexual satisfaction, explicit interest in alternatives, availability of alternatives, self-control, attachment anxiety, attachment avoidance, number of prior short-term sexual partners, own and partner age, and own and partner facial attractiveness. Results are reported in Table 4. As can be seen, the key effect remained significant.⁸

Additionally, several other independent predictors of infidelity emerged and several others interacted with participant sex. Regarding predictors that did not vary across men and women, sexual satisfaction was again positively associated with infidelity and age was negatively associated with infidelity. Regarding the significant interactions with participant sex, own attractiveness was again negatively associated with infidelity among

⁶ A supplemental analysis indicated that the association between attentional disengagement and infidelity remained marginally significant when predicting only the infidelities that were reported by the actors themselves, $\beta = 0.82$, $SE = 0.44$, $t(200) = 1.88$, $p = .061$; this effect was not moderated by study, $\beta = -0.29$, $SE = 0.36$, $t(199) = -0.81$, $p = .421$. An additional supplemental analysis indicated that the association between attentional disengagement and infidelity remained significant when predicting only the infidelities that were agreed upon by both partners, $\beta = 0.97$, $SE = 0.34$, $t(201) = 2.87$, $p = .005$; this effect also was not moderated by study, $\beta = -0.26$, $SE = 0.33$, $t(200) = -0.79$, $p = .432$.

⁷ A supplemental analysis indicated that the effect was not moderated by participant sex, $\beta = 0.01$, $SE = 0.35$, $t(104) = 0.03$, $p = .973$. Further, an additional set of supplemental analyses indicated that it was not moderated by initial commitment, $\beta = 0.02$, $SE = 0.20$, $t(91) = 0.12$, $p = .907$, or changes in commitment, $\beta = -0.17$, $SE = 0.35$, $t(91) = -0.48$, $p = .635$.

⁸ A supplemental analysis indicated that the association between devaluation and infidelity remained significant predicting only the infidelities reported by actors themselves, $\beta = 1.01$, $SE = 0.20$, $t(87) = 5.04$, $p < .001$; however, after removing the interactions involving participant sex (which was necessary to allow the model to converge), devaluation did not significantly predict the very few infidelities agreed upon by both partners, $\beta = -0.22$, $SE = 0.15$, $t(92) = -1.42$, $p = .159$.

Table 3
Attention to Attractive Alternatives and Covariates Predicting Infidelity in Studies 1 and 2

Factor	β	SE	OR	CI _{95%}	
Intercept	-2.32***	.47	.10	.04:	.25
Study	1.14	.86	3.11	.57:	16.93
Participant sex	-.15	.36	.86	.42:	1.75
Marital satisfaction	-.45***	.14	.64	.49:	.83
Commitment × Study	.81*	.31	2.25	1.22:	4.16
Study 1	-.33	.24	.72	.45:	1.17
Study 2	.48*	.20	1.62	1.08:	2.42
Sexual satisfaction	.40*	.17	1.49	1.06:	2.09
Interest in Alternatives × Study	1.90*	.89	6.66	1.16:	38.24
Study 1	-.29	.79	.75	.16:	3.58
Study 2	1.61***	.34	4.99	2.54:	9.81
Attachment anxiety	-.32 [†]	.17	.73	.52:	1.01
Attachment avoidance	.29	.21	1.33	.88:	2.02
Self Control × Study	-.58*	.26	.56	.34:	.93
Study 1	.26	.20	1.29	.88:	1.90
Study 2	-.32*	.15	.72	.53:	.98
Self Control × Sex	-.59*	.24	.55	.34:	.89
Men	.26	.16	1.29	.94:	1.79
Women	-.34 [†]	.18	.71	.50:	1.01
Own Attractiveness × Sex	-.75*	.30	.47	.26:	.86
Men	.04	.18	1.04	.73:	1.48
Women	-.71**	.24	.49	.30:	.79
Partner Attractiveness × Sex	.73*	.30	2.08	1.16:	3.73
Men	-.65**	.19	.52	.36:	.75
Women	.08	.22	1.08	.70:	1.67
Age	.02	.29	1.02	.58:	1.81
Partner age	-.77**	.30	.46	.26:	.83
Availability of alternatives	-.09	.17	.91	.65:	1.28
Number of short-term sex partners × Sex	-.76**	.26	.47	.28:	.79
Men	.32 [†]	.18	1.38	.96:	1.98
Women	-.44 [†]	.24	.64	.40:	1.03
Attn. to attractive same-sex faces	-.68 [†]	.37	.51	.24:	1.05
Attn. to average opposite-sex faces	-.65	.53	.52	.18:	1.49
Attn. to average same-sex faces	-.40	.76	.67	.15:	2.99
Attn. to attractive opposite-sex Faces × Study	.93**	.31	2.54	1.37:	4.71
Study 1	.61 [†]	.34	1.85	.94:	3.64
Study 2	1.55***	.41	4.70	2.11:	10.45

Note. Higher scores indicate less attentional disengagement (i.e., greater attention). “× Study” indicates that the reported effect is the interaction by Study; “× Sex” indicates that the reported effect is the interaction by Participant Sex. In those cases, simple effects are also reported. For Intercept and Study, $df = 230$; for all other effects, $df = 198$. CI_{95%} represents confidence interval for the Odds Ratio (OR).

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

wives and partner attractiveness was again negatively associated with infidelity among husbands; further, marital satisfaction was negatively associated with infidelity among husbands but positively associated with infidelity among wives, though the association among wives was only marginally significant; attachment avoidance was also positively associated with infidelity among wives; finally, commitment was negatively associated with infidelity among wives, although this association was also only marginally significant.

Finally, we also conducted additional analyses to determine whether devaluing alternatives was associated with infidelity because (a) faithful people tended to evaluate attractive alternatives less positively than singles, (b) unfaithful people tended to evaluate attractive alternatives more positively than singles, or (c) both (see Lydon et al., 2003). We addressed this question by regressing the raw difference between participants' and singles' evaluations of the attractive alternatives onto a dummy code for infidelity and evaluations of the other three targets.

The intercept from this model represents the difference between participants' and singles' evaluations of attractive, opposite sex individuals for people coded 0 on all variables. Thus, we again centered the covariates on the sample mean and coded infidelity two ways—once such that 0 represented people who were unfaithful and once such that 0 represented people who were faithful. According to this analysis, faithful people evaluated the attractive alternatives significantly more negatively than did singles, $\beta = -0.77$, $SE = 0.10$, $t(112) = -7.33$, $p < .001$, whereas unfaithful people did not differ from singles, $\beta = -0.16$, $SE = 0.46$, $t(112) = -0.34$, $p = .735$.

Do Attentional Disengagement From and Devaluation of Attractive Alternatives Exert Indirect Effects on Dissolution Through Their Effects on Infidelity?

The preceding analyses can be understood as estimating path a of two different mediational models to capture the indirect effects

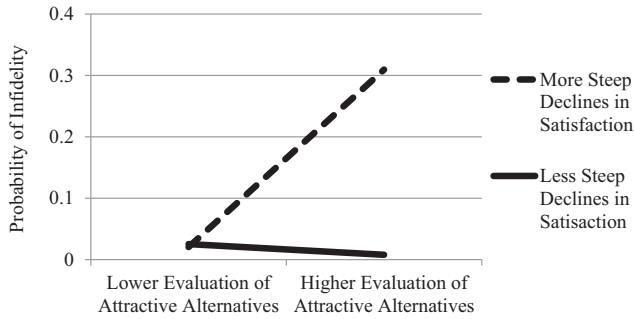


Figure 1. Interactive effects of devaluation of attractive alternatives \times declines in marital satisfaction predicting probability of infidelity. *SEs* in parentheses. ** $p < .01$, *** $p < .001$.

of each process on marital dissolution through infidelity (see Figure 2). In our final set of analyses, we estimated path b for each model by estimating the association between marital dissolution and whether or not actors engaged in an infidelity, controlling for each process. We then followed the recommendations of MacKinnon, Fritz, Williams, and Lockwood (2007) to calculate the corresponding confidence interval of each mediated effect using RMediation (Tofghi & MacKinnon, 2011).

Regarding raw percentages, 27% of the people who engaged in an infidelity ended up dissolving their relationship whereas 11% of the people who did not engage in an infidelity ended up dissolving their relationship. We examined path b for attentional disengagement by estimating whether infidelity was associated with relationship dissolution, controlling for attention to attractive alternatives. Given dissolution is a couple-level variable, we estimated this association by again regressing infidelity onto the time it took participants to disengage from attractive alternatives, controlling for disengagement from the other targets and the same covariates as in the previous model, but this time we entered relationship dissolution as an additional level-2 predictor. We again specified a Bernoulli sampling distribution. This model estimates the association between infidelity and relationship dissolution, controlling for the association between attentional disengagement and infidelity as well as all covariates. Consistent with the second criterion necessary for establishing mediation, infidelity was positively associated with the probability of dissolution, controlling attentional disengagement as well as all covariates and significant interactions, $\beta = 1.12$, $SE = 0.37$, $t(229) = 3.04$, $p = .003$. We multiplied this estimate together with the estimate of the corresponding path a (the association between attentional disengagement and infidelity controlling all covariates) to estimate the indirect effect, and computed the corresponding 99% confidence

Table 4
Devaluation of Attractive Alternatives and Covariates Predicting Infidelity in Study 1

Factor	β	<i>SE</i>	<i>OR</i>	<i>CI</i> _{95%}	
Intercept	-3.68***	.19	.03	.02:	.04
Participant sex	.42	.70	1.52	.38:	6.13
Marital Satisfaction \times Sex	1.81***	.49	6.09	2.32:	15.97
Men	-.98**	.33	.38	.19:	.73
Women	.83 [†]	.48	2.29	.88:	5.93
Commitment \times Sex	-1.08**	.39	.34	.16:	.74
Men	.32	.32	1.38	.73:	2.59
Women	-.76 [†]	.41	.47	.21:	1.05
Sexual satisfaction	.63*	.29	1.88	1.06:	3.33
Interest in alternatives	-.36	.26	.70	.42:	1.18
Attachment anxiety	-.21	.15	.81	.60:	1.09
Attachment Avoidance \times Sex	1.07*	.52	2.91	1.04:	8.13
Men	-.21	.49	.81	.30:	2.15
Women	.85***	.20	2.35	1.59:	3.46
Self control	.01	.24	1.01	.63:	1.63
Own Attractiveness \times Sex	-.96*	.39	.38	.18:	.83
Men	.00	.26	1.00	.60:	1.69
Women	-.96**	.34	.38	.19:	.76
Partner Attractiveness \times Sex	1.18***	.32	3.25	1.71:	6.20
Men	-.98***	.21	.38	.25:	.57
Women	.20	.25	1.22	.74:	2.02
Age	-.66*	.31	.52	.28:	.96
Partner age	.21	.26	1.23	.73:	2.08
Availability of alternatives	.12	.19	1.13	.77:	1.67
Number of short-term sex partners	.07	.25	1.08	.66:	1.76
Evaluation of attractive same-sex faces	-.56*	.22	.57	.37:	.90
Evaluation of average opposite-sex faces	-.22	.30	.81	.44:	1.47
Evaluation of average same-sex faces	-.49 [†]	.25	.61	.37:	1.01
Evaluation of attractive opposite-sex faces	.78***	.23	2.18	1.39:	3.42

Note. Higher scores indicate less devaluation (i.e., more positive evaluations). " \times Sex" indicates that the reported effect is the interaction by Participant Sex. In those cases, simple effects are also reported. For Intercept and Sexual Frequency, $df = 112$; for all other effects, $df = 87$.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

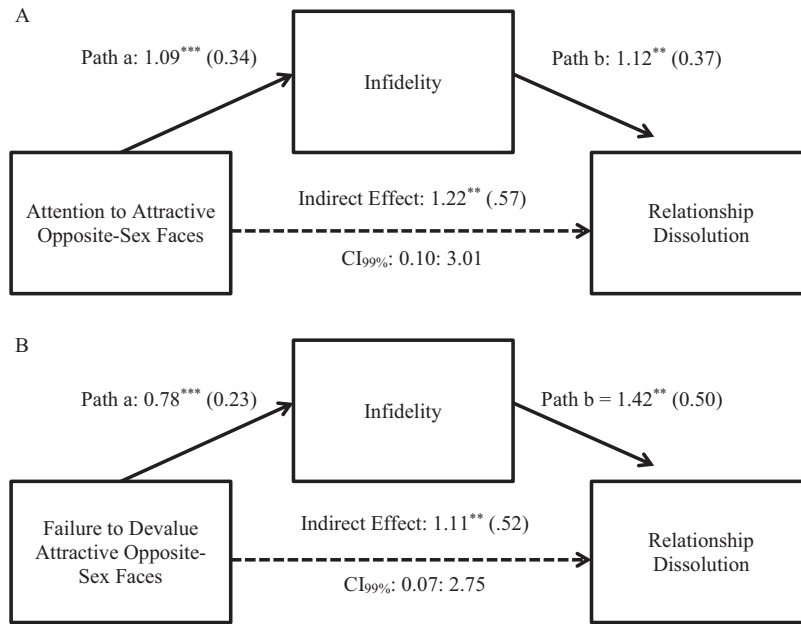


Figure 2. Indirect effect of attention to and devaluation of attractive alternatives on relationship dissolution through infidelity.

interval ($CI_{99\%}$) of the mediated effect, which was significant. These effects are reported in Panel A of Figure 2.⁹

We examined path b for devaluation of alternatives by estimating whether infidelity was associated with relationship dissolution, controlling for devaluation of attractive alternatives. We estimated this association by once again regressing infidelity onto the devaluation of attractive alternatives, controlling for the devaluation of the other targets and the same covariates as in the previous model, and entering relationship dissolution as an additional level-2 predictor. We again specified a Bernoulli sampling distribution. Consistent with the second criterion necessary for establishing mediation, infidelity was positively associated with the probability of dissolution, controlling devaluation of attractive alternatives as well as all covariates and significant interactions, $\beta = 1.42$, $SE = 0.50$, $t(111) = 2.87$, $p = .005$. We multiplied this estimate together with the estimate of the corresponding path a (the association between devaluation of attractive alternatives and infidelity controlling all covariates) to estimate the indirect effect and computed the corresponding $CI_{99\%}$ of the mediated effect, which was significant. These effects are reported in Panel B of Figure 2.¹⁰

Discussion

Summary and Interpretation of Results Involving Attention and Devaluation

Relationship science has made great strides in demonstrating the critical role of successful long-term romantic relationships in promoting achievement, health, and well-being (Fitzsimons et al., 2015; Holt-Lunstad et al., 2010; Proulx et al., 2007; Robles et al., 2014). Likewise, relationship science has made great strides in illuminating some of the psychological processes that help people remain satisfied with those relationships (Bradbury et al., 2000;

Finkel et al., 2017; Karney & Bradbury, 1995; McNulty, 2016). Nevertheless, theory (Kelley & Thibaut, 1978, also see Rusbult, 1980) and empirical work (Previti & Amato, 2004) suggest a second factor that poses an independent threat to commitment—the lure of alternative relationship partners and infidelity. Even people who are happy with their current relationships engage in infidelities that can ultimately end their relationships. In fact, empirical work suggests infidelity is the most common predictor of relationship dissolution across 160 societies (Betzig, 1989; see Fincham & May, 2017). With the advent of social media, and thus the increased availability of and access to alternative partners, understanding how people avoid the temptation posed by alternative partners may be more relevant than ever to understanding relationships.

⁹ The association between infidelity and marital dissolution remained significant when controlling for disengagement from the all types of targets and the dummy code for study but not the other covariates, $\beta = 1.11$, $SE = 0.39$, $t(230) = 2.84$, $p = .005$, as did the corresponding indirect effect [$CI_{95\%}$ 0.08: 2.03]. Further, the association between infidelity and marital dissolution also remained significant when using only the infidelities reported by the actors, $\beta = 1.89$, $SE = 0.44$, $t(229) = 4.30$, $p < .001$, and only the infidelities agreed upon by both partners, $\beta = 1.77$, $SE = 0.46$, $t(229) = 3.84$, $p < .001$.

¹⁰ The association between infidelity and marital dissolution remained significant when controlling for devaluation and evaluations of the other three stimuli but not the other covariates, $\beta = 1.80$, $SE = 0.58$, $t(111) = 3.13$, $p = .002$, as did the corresponding indirect effect [$CI_{95\%}$ 0.01: 2.16]. Further, after removing the interactions involving participant sex (again necessary to allow the model to converge), the association between infidelity and marital dissolution remained significant when using only the infidelities reported by the actors, $\beta = 3.91$, $SE = 0.52$, $t(111) = 7.52$, $p < .001$, as well as only the infidelities agreed upon by both partners, $\beta = 3.44$, $SE = 0.52$, $t(111) = 6.64$, $p < .001$.

In the current research, we provide novel evidence that two psychological biases effectively minimize relationship dissolution by minimizing the probability of infidelity—the automatic tendency to more readily disengage attention from attractive alternatives (see Maner et al., 2009; Miller, 1997) and the tendency to devalue the attractiveness of such alternatives (Johnson & Rusbult, 1989; Lydon et al., 1999; Simpson et al., 1990). In two studies spanning the first several years of 233 marriages, the tendency to disengage attention from photos of attractive individuals of the opposite sex in the lab was directly associated with a decreased probability of infidelity. In one of the studies of 113 couples, the tendency to devalue the attractiveness of those alternatives was also directly associated with a decreased probability of infidelity. In quantitative terms, being 100 ms faster to disengage attention from photos of attractive alternatives or rating those alternatives 2 points lower was associated with a decreased odds of infidelity of approximately 50%. These effects emerged independent of numerous covariates and neither effect varied across marital satisfaction, commitment, or changes in commitment (see footnotes 5 and 7). Nevertheless, the effect of devaluation was moderated by changes in marital satisfaction, such that it was stronger among people who experienced steeper declines in marital satisfaction. Both processes were also directly associated with a decreased likelihood of relationship dissolution, even after controlling changes in marital satisfaction, although the association involving devaluation and dissolution did not reach statistical significance. Most importantly, both processes were indirectly associated with relationship dissolution through their effects on infidelity.

We also identified several predictors of these relationship-maintenance processes. Consistent with prior research showing an association between unrestricted sociosexuality and attentional disengagement among men (Maner et al., 2007), results demonstrated that an indicator of unrestricted sociosexuality, a greater number of prior short-term sexual relationships, was associated with less attentional disengagement, an effect that did not vary across either study or across participant sex. Reporting a greater number of prior short-term sexual relationships was also associated with less devaluation, but only among men.

Although there were no other significant predictors of attentional disengagement from attractive alternatives, there were several additional predictors of devaluation. It is worth keeping in mind, however, that these effects emerged in new marriages that may capture a phase of relationships that is psychologically different from other phases examined in previous research (e.g., dating, established marriage). Further, the predictors of devaluation were based on a relatively large number of tests in analyses that were fairly exploratory and only conducted in one of the studies. First, people with less (vs. more) self-control were more likely to devalue attractive alternatives. This finding is consistent with the possibility that people have an initial automatic tendency to devalue alternatives that they are sometimes motivated to override with the cognitive resources afforded by self-control. Indeed, not only does devaluation appear to have automatic properties (Cole et al., 2016) even when measured explicitly (Karremans et al., 2011; Karremans & Verwijmeren, 2008), similar effects have emerged for other relationship-maintenance processes. For instance, Righetti, Finkenauer, and Finkel (2013) demonstrated that communal orientation was only associated with the tendency to sacrifice among people with relatively low levels of self-control. Future research may benefit from examining what motivations lead people to

use self-control to override any automatic tendencies to devalue their alternatives. Second, and related, people who expressed more (vs. less) interest in relationship alternatives were also less willing to admit that the attractive alternatives they viewed in the laboratory were attractive. Although this association was only marginally significant, and unpredicted, it is also consistent with the idea that devaluation is partly automatic (Cole et al., 2016) and activated by relationship threat (Johnson & Rusbult, 1989; Lydon et al., 1999). That is, just as motivation can lead people with more negative automatic partner attitudes to report more positive relationship satisfaction explicitly (Scinta & Gable, 2007), people who perceive relationship alternatives as more attractive may be particularly likely to self-report not being interested in them. It is worth noting, however, that Miller (1997) demonstrated a positive association between self-reported interest in alternatives and ratings of attractive alternatives in the lab among students involved in dating relationships. Consistent with the commitment calibration findings described earlier (Lydon et al., 1999), the commitment associated with being in a new marriage may activate maintenance motives that were stronger among the newlyweds examined here than among the individuals examined in that initial study. Third, people with less attractive partners were also less willing to admit that the attractive alternatives were attractive. Again in line with the idea that attractive alternatives activate the devaluation process among committed people because they are particularly threatening (Johnson & Rusbult, 1989; Lydon et al., 1999), it may be that attractive alternatives are particularly threatening to and thus activate this maintenance process among those with less attractive partners. Fourth, people higher (vs. lower) in attachment avoidance evaluated attractive alternatives more negatively. This finding makes sense in light of the idea that married people who are relatively high in attachment avoidance may be biased toward avoiding extramarital entanglements (see Russell et al., 2013). Finally, and not as surprisingly, older (vs. younger) people evaluated the alternatives more positively.

Participant sex moderated the effect of two additional predictors of people's tendencies to devalue attractive alternatives. First, participant sex moderated the association between partner age and devaluation, such that men, but not women, with older partners rated the opposite sex attractive others more negatively than did those with younger partners. Given men's preference for youth (see Buss & Schmitt, 1993), attractive alternatives may be particularly threatening and thus motivate this maintenance process among men with older partners. Second, participant sex moderated the association between the availability of alternative partners and evaluations of attractive alternatives, such that men who perceived fewer (vs. more) available partners rated the opposite-sexed attractive alternatives more negatively whereas women who perceived fewer (vs. more) available partners rated the attractive alternatives more positively, although the effect among women was only marginally significant. Given that the interactive effect and both simple effects were unpredicted, we hesitate to make post hoc explanations for either of them, and instead allow them to await replication.

Taken together, the factors that emerged to predict both processes were mostly individual in nature; dyadic processes failed to predict either process. It thus appears that, at least in highly committed relationships such as new marriages, these processes reflect characteristics of individuals and their responses to threatening environmental situations rather than dyadic qualities of their relationships. In fact, the prominent role played by the number of prior short-term sexual

relationships highlights a possible role of early environmental circumstances in ultimately explaining these effects. According to life history perspectives (see Belsky, Schlomer, & Ellis, 2012; Ellis, Figueredo, Brumbach, & Schlomer, 2009), early ecologies marked by harshness and instability promote faster reproductive strategies, which are characterized by earlier reproduction and less investment in offspring. In humans, for example, individuals who experience relatively harsh and unpredictable childhoods demonstrate earlier onset of puberty and sexual maturity (see Ellis, 2004), more sexual partners (Simpson, Griskevicius, Kuo, Sung, & Collins, 2012), and less restricted socio-sexual orientations (Szepeswol et al., 2017). Compared with “slower” strategies that involve delayed reproduction and more investment in offspring, such “fast” reproductive strategies are theoretically adaptive in unpredictable environments. The key point with respect to the current work is that any stable individual differences in orientations toward mating that result from early childhood experiences, such as a desire for youth or short-term sexual encounters, may partially manifest as the basic attentional and evaluative mechanisms assessed here. Future work may benefit from examining whether these basic psychological processes are indeed linked to early childhood harshness and/or instability, as well as the implications of exposure to early harsh ecologies for marriage.

This individual-differences perspective may also help explain why commitment to the relationship was unrelated to either process in the current work; that is, committing to one partner may not “turn off” certain psychological mechanisms that are either hardwired genetically or were activated during childhood. Instead, individual differences characterized by a psychological orientation toward attractive alternatives may continue to manifest through these basic psychological mechanisms, even in marriage and regardless of one’s commitment. Of course, this perspective needs to be reconciled with the fact that commitment has been related to both attentional disengagement and devaluation in prior research (Lydon et al., 1999, 2003; Maner et al., 2009; Miller, 1997). One such reconciliation may come from (a) recognizing that most prior research has involved people in dating relationships, and (b) considering the possibility that these associations may have emerged because these processes predict commitment rather than vice versa. That is, people who are psychologically oriented toward faster reproductive strategies may possess psychological mechanisms that facilitate this orientation, such as the attention and evaluative mechanisms examined here, and these mechanisms may minimize the likelihood that they commit to one partner. Of course, given modern cultural barriers to being single (see Depaulo & Morris, 2005; Finkel, Hui, Carswell, & Larson, 2014), even people with psychological mechanisms that orient them toward a fast reproductive strategy may eventually marry in today’s society. Once they do, the current research suggests that their tendencies to attend to and positively evaluate potential alternatives do not minimize their commitment to those relationships and their commitment does not minimize their orientation toward alternatives, at least over the first several years of such relationships. Indeed, consistent with the earlier point that the newlywed phase may be psychologically unique, the newlywed period appears to be a time during which commitment and satisfaction are maximized (see Huston, Caughlin, Houts, Smith, & George, 2001; Karney & Bradbury, 1995; Schoebi, Karney, & Bradbury, 2012). In fact, commitment was very high in the current research. In this phase of relationships, and potentially even in more established marriages, automatically attending to attractive alternatives and evaluating them positively may thus predict a desire and

tendency to pursue extradyadic sexual relationships independent of commitment to the primary relationships. Indeed, consistent with the secretive nature of infidelity (see Fincham & May, 2017), and given that neither process predicted changes in commitment or commitment at the end of the current studies, many unfaithful actors may desire to continue their primary relationship. Accordingly, each process may lead to relationship dissolution through unforeseen consequences of infidelity such as becoming attached to the alternative or disconnected from the primary partner.

Nevertheless, it is also worth noting that the attractive alternatives examined here were not threatening in ways that have been examined elsewhere; for instance, we did not manipulate the targets’ ostensible interests in participants (see Lydon et al., 1999). Likewise, we did not specifically enhance relationship-maintenance motivations among the participants (see Maner et al., 2009). Although we assume that any existing relationship motivations are chronically activated in the early years of marriage, especially in the context of a study of marriage, more threat or enhanced motivation may have revealed an association with commitment. Again, however, it is meaningful that each process was directly associated with infidelity and indirectly associated with relationship dissolution without enhancing threat or specifically activating relationship-maintenance motives

Novel Predictors of Infidelity

We also identified several additional predictors of infidelity that were independent of the two primary maintenance processes we examined, although the robustness of each predictor varied somewhat. The three most robust predictors in the analysis that collapsed across the two studies were marital satisfaction, partner age, and sexual satisfaction; marital satisfaction and age were negatively associated with infidelity and these associations did not vary across participant sex or the two studies; people who were less (vs. more) satisfied with their relationships overall and younger (vs. older) were more likely to engage in an infidelity. In contrast, sexual satisfaction was surprisingly positively associated with infidelity, suggesting that people who were more (vs. less) sexually satisfied were more likely to engage in an infidelity. It is important to keep in mind, however, that the positive association between sexual satisfaction and infidelity emerged controlling for the negative association between marital satisfaction and infidelity, indicating it is variance in sexual satisfaction that is independent of relationship satisfaction that is associated with infidelity. Thus, it may be that people who feel particularly positive about sex in general, regardless of how they feel about their partners or relationships specifically, are more likely to engage in an infidelity. Finally, attachment anxiety was negatively associated with infidelity; however, this association was only marginally significant and challenges prior research suggesting that attachment anxiety is associated with a greater probability of infidelity (Russell et al., 2013); thus, it should be interpreted with caution.

The most notable predictors of infidelity that varied across sex were own and partner attractiveness. Specifically, own attractiveness was negatively associated with infidelity among women, but not men, suggesting that less attractive women were more likely to engage in an infidelity; partner attractiveness, in contrast, was negatively associated with infidelity among men, but not women, suggesting that men were more likely to engage in an infidelity when their partners were less attractive. This latter sex difference

is consistent with evidence that partner attractiveness is more important to men than it is to women (Li et al., 2013; McNulty, Neff, & Karney, 2008; Meltzer et al., 2014a, 2014b), and thereby challenges the idea that the importance of partner attractiveness is equivalent across men and women (see Eastwick & Finkel, 2008). Additionally, participant sex moderated the association between the number of prior short-term sexual partners and infidelity, such that men who reported more short-term sexual partners were more likely to engage in an infidelity. Although this association was only marginally significant, it is consistent with other research indicating that sociosexuality is associated with inclinations toward infidelity among men (Barta & Kiene, 2005). Among women, this association was negative, although also only marginally significant. Finally, in an analysis of data involving only Study 1, participant sex also moderated the effects of both commitment and attachment avoidance on infidelity; women, but not men, who were low (vs. high) in commitment or high (vs. low) in attachment avoidance were more likely to engage in an infidelity, although the former association was only marginally significant. The latter finding is consistent with the findings of DeWall et al. (2011) who found that attachment avoidance was positively associated with tendencies toward infidelity among individuals in dating relationships (but see Russell et al., 2013).

The associations between infidelity and self-reported interest in alternatives, self-control, and commitment were moderated by study. Interest in alternatives was positively associated with infidelity in Study 2, though not in Study 1. Likewise, consistent with past research (McIntyre et al., 2015), self-control was negatively associated with infidelity in Study 2, though not in Study 1. The effect of self-control was also moderated by participant sex, however, such that it only emerged among women. Finally, commitment was positively associated with infidelity in Study 2, but not Study 1. Given this latter effect is quite counterintuitive and differed across the two studies, any conclusions should be drawn with caution.

Limitations

In fact, all findings should be considered in light of several limitations. First, we did not assess whether the couples in these studies were in consensually nonmonogamous relationships. The fact that our measures of infidelity significantly predicted dissolution, regardless of whether the infidelity was reported by either of the two partners, actors only, or both partners, provides some confidence that we captured unwanted extradyadic sexual relations. Nevertheless, it remains possible that some of the extradyadic sexual relations we assessed were in fact accepted and agreed upon behaviors in any unidentified nonmonogamous couples in our samples. Not only would future research on infidelity benefit from more clearly assessing any consent partners have granted one another for extradyadic sex, research directly examining these particular processes may benefit from examining whether their sources and implications differ across monogamous and consensually nonmonogamous couples. Second, and relatedly, infidelity is notoriously difficult to measure (Fincham & May, 2017), given motivations on the part of both partners to avoid reporting information that suggests negative qualities (see DeMaio, 1984; Tourangeau & Yan, 2007). We attempted to minimize measurement problems by assuming an infidelity reported by either mem-

ber of the couple was in fact an infidelity, regardless of whether it was corroborated by the other member of the couple. Nevertheless, we also demonstrated that the predicted effects replicated using only the infidelities reported by the actors themselves—a more conservative estimate of infidelity, and mostly replicated using only mutually reported infidelities—a much more conservative estimate of infidelity. Third, the marriages examined here were all new marriages. The effectiveness of the relationship-maintenance mechanisms examined here may vary according to relationship length, and could operate differently in newer or more-established relationships. Finally, the analyses of the predictors of the relationship-maintenance processes were rather exploratory and involved numerous tests; thus, conclusions should be drawn with caution, as they could be Type I errors. This is particularly true for analyses predicting devaluation, which involved only one study and produced several unpredicted interactions involving participant sex. In fact, all effects involving devaluation should be considered in light of the fact that they were tested in only one study.

Broader Theoretical and Practical Implications

These limitations notwithstanding, this work has important implications. First, these findings critically extend research suggestive of two psychological biases that help people maintain long-term relationships. Although previous research has revealed that more committed people are more likely to disengage their attention from and devalue the attractiveness of attractive relationship alternatives (Johnson & Rusbult, 1989; Lydon et al., 1999, 2003; Maner et al., 2008, 2009; Miller, 1997; Ritter et al., 2010; Simpson et al., 1990), the current research is the first to provide evidence that these biases are actually effective in keeping partners together by minimizing infidelity. Further, supplemental analyses confirmed that these mechanisms did not merely minimize dissolution by maintaining relationship satisfaction, suggesting that they do offer benefits independent from processes already known to maintain relationship satisfaction (Bradbury et al., 2000; Finkel et al., 2017; Karney & Bradbury, 1995; McNulty, 2016). In sum, these findings suggest that people are equipped with psychological biases that facilitate long-term relationships by minimizing the independent threat of relationship alternatives and infidelity (Kelley & Thibaut, 1978). Future work may benefit from examining whether other relationship-maintenance mechanisms have similar implications. For example, recent evidence indicates that sexual satisfaction lingers 48 hours after sex, a phenomenon referred to as sexual afterglow, and that the strength of this afterglow functions to maintain pair bonds with the primary partner over time (Meltzer, Makhanova, Hicks, French, McNulty, & Bradbury, 2017). Future research may benefit from examining whether afterglow minimizes infidelity.

Second, these findings join a growing body of research indicating that automatic social-cognitive processes play a powerful role in shaping long-term relationships (Lee, Rogge, & Reis, 2010; McNulty, Baker, & Olson, 2014; McNulty, Olson, Jones, & Acosta, 2017; McNulty, Olson, Meltzer, & Shaffer, 2013; Murray, Gomillion, Holmes, Harris, & Lamarche, 2013; Scinta & Gable, 2007). Given the critical role of the processes examined here in helping to maintain relationships, it is not surprising that they can occur without intention or effort (see Cole et al., 2016; Maner et al., 2007). Indeed, as has been argued elsewhere (Hicks, McNulty,

Meltzer, & Olson, 2016; McNulty & Olson, 2015), many relational processes may be so deeply rooted that they require little effort or conscious awareness to be activated (see Fazio, Sanbonmatsu, Powell, & Kardes, 1986). This automaticity likely contributes to their effectiveness; given these strategies do not require intention and effort, they can help maintain relationships even when cognitive resources are low or devoted to other goals (McNulty & Olson, 2015). This may be particularly true in new marriages like the ones examined here. That said, not only are there between-person differences in automatic relationship-maintenance mechanisms, sufficient cognitive resources and motivation to behave otherwise can allow people to override automatic tendencies (e.g., Fazio & Olson, 2014), as evidenced by the role of self-control in predicting devaluation in the current research. The sources of such motivations are likely critical to understanding why some people engage in infidelity despite the automatic relationship mechanisms examined here. We provided some initial evidence of such motivations. Most notably, prior number of short-term sexual encounters predicted men and women being slower to disengage attention from attractive alternatives and men being less likely to devalue such alternatives. Future research may investigate whether other dispositional predictors of infidelity operate in similar ways (see Altgelt et al., 2017; Atkins et al., 2001).

Finally, these findings may have important practical implications by suggesting ways that practitioners can help people remain committed to their partners. A growing body of research indicates that rehearsal can automatize various processes, including the attentional and evaluative (i.e., associative, see Fazio, 2007) mechanisms examined here (Hofmann, De Houwer, Perugini, Baeyens, & Crombez, 2010; Schmidt, Richey, Buckner, & Timpano, 2009). For instance, studies on attention training indicate that people can be trained to effectively disengage their attention from threatening stimuli (Schmidt et al., 2009). Attention training may also help people disengage their attention from attractive alternatives and thus reduce the probability of infidelity (although see DeWall, Maner, Deckman, & Rouby, 2011). Likewise, research on evaluative conditioning indicates that repeatedly pairing target stimuli with stimuli that are already liked or disliked can lead to automatic positive or negative evaluations of those target stimuli, respectively (Hofmann et al., 2010; McNulty et al., 2017). Evaluative conditioning may thus prove an effective way to help people devalue specific threatening alternatives (e.g., exes) and thus reduce the likelihood of infidelity. Future research may benefit from examining these possibilities.

Conclusion

Although long-term romantic relationships play a critical role in fostering important outcomes like career success, mental health, and physical health (Fitzsimons et al., 2015; Proulx et al., 2007; Robles et al., 2014), those relationships are consistently threatened by the presence of tempting relationship alternatives. The current work shows for the first time that basic psychological biases that vary across people and can be observed with novel measures in the context of the laboratory contribute directly to the successful maintenance of long-term relationships. The current research thus places a crucial capstone on a rich and critical component of relationship science.

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Received April 26, 2017

Revision received December 1, 2017

Accepted December 1, 2017 ■