



Sexual Desire Mediates the Relationship-Promoting Effects of Perceived Partner Mate Value

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Abstract

Although sexual desire for one's partner is theorized to serve as a gut-level indicator of partner mate value that motivates investment in valued partners, there is scant empirical evidence to support this hypothesis. Five studies addressed this possibility, examining whether experiencing sexual desire encouraged the enactment of relationship-promoting behaviors and whether perceptions of partner mate value motivated this proposed process. In a pilot study and Study 1, participants relived an activity they experienced with their partner, which was either sexual or non-sexual. Then, participants rated their desire to engage in sex and other non-sexual relationship-promoting activities with their partner (pilot study) and their partner's responsiveness to personal disclosures. Participants' enacted responsiveness was also evaluated by judges (Study 1). Results showed that experiences of desire enhanced relationship-promoting tendencies. Using experimental, daily experiences, and longitudinal methods, Studies 2–4 extended these findings, indicating that both manipulated and perceived partner mate value predicted desire, which, in turn, was associated with engagement in relationship-promoting behaviors. These findings demonstrate that sexual desire functions as a mechanism encouraging investment in partners who are perceived to be worth pursuing and retaining.

Keywords Mate value · Sexual desire · Relationship maintenance · Romantic relationship

Introduction

Sex carries the potential to operate as a stabilizing attachment-facilitating device that motivates partners to invest resources in their relationship (Birnbaum, 2018; Birnbaum & Finkel, 2015; Birnbaum & Reis, 2019). Previous studies have indicated that experiencing intense passion for one's partner and satisfying sex predicts a higher probability of enacting relationship-promoting behaviors (e.g., displays of intimacy and affection; Birnbaum et al., 2006; Debrot et al., 2017; Rubin & Campbell, 2012). Although these and other studies suggest that sex contributes to relationship maintenance, only a handful of studies have investigated whether

manipulating the activation of the sexual system has systematic effects on the motivation to engage in non-sexual relationship-promoting behaviors (e.g., self-disclosure, sacrificing for the relationship; Birnbaum et al., 2017; Gillath et al., 2008). Such manipulations are needed to firmly establish that sexual desire has a causal effect on partners' motivation to engage in non-sexual relationship-promoting behaviors.

The few studies that have focused on the relationship-maintenance function of sex have relied on hypothetical beliefs about dyadic interactions rather than actual interactions (Gillath et al., 2008), rendering unknown the real-world predictive validity of models derived from this work. Furthermore, these studies have not addressed the functional significance of sexual desire in the relationship-development process, failing to clarify why experiencing sexual desire for a partner promotes investment in the relationship with this partner. In the present research, we used complementary methods to test the possibility that sexual desire for one's partner functions as a mate-retaining mechanism that signifies a partner's mate value and thereby motivates engagement in relationship-enhancing behaviors (e.g., the provision of responsiveness or sacrificing to benefit the partner) that will

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promote the relationship with a valued partner. Specifically, we examined whether sexual desire would inspire changes in relationship-promoting behavior and whether this process would be propelled by perceptions of partner mate value (i.e., the total value of characteristics an individual possesses that contributes to this individual's ability to successfully attract and retain a mate; Fisher et al., 2008).

The Relationship-Promoting Function of Sex

The sexual behavioral system evolved to facilitate reproduction; it does so by instigating sexual desire that motivates the pursuit of desirable partners in an attempt to entice them to engage in sex (Birnbaum et al., 2014; Buss & Kenrick, 1998). As such, the existence of the sexual system is not dependent on attachment processes (i.e., sexual activity usually begins before an attachment bond has been formed; Diamond, 2013; Fisher, 1998; Fisher et al., 2002). And yet, the prolonged vulnerability of human offspring required the development of mechanisms that keep partners attached to each other so that they can jointly care for their offspring and improve their survival chances (Eastwick, 2009; Fletcher et al., 2015).

Past studies suggest that the sexual system serves such a function (Birnbaum & Finkel, 2015; Eastwick & Finkel, 2012; Hazan & Zeifman, 1994). In particular, neuroimaging research has revealed a similar pattern of brain region activation during experiences of sexual desire and romantic love (e.g., caudate, insula, putamen; Cacioppo & Cacioppo, 2013; Diamond & Dickenson, 2012), implying the existence of a pathway that fosters emotional bonding through sexual activation. Supporting this possibility, research has shown that the attachment-facilitating neuropeptide oxytocin (Young et al., 2014) is secreted during sexual activity (Carter, 2014).

To be sure, people generally associate sex with emotional bonding both automatically and consciously, exhibiting greater accessibility of intimacy-related thoughts following subliminal exposure to sexual stimuli (vs. neutral stimuli; Gillath et al., 2008) and declaring that they often have sex to intensify their relationships (Birnbaum & Gillath, 2006; Birnbaum & Reis, 2006). Longitudinal studies show that people act accordingly and are particularly likely to engage in relationship-enhancing behaviors (e.g., displays of intimacy and affection) and to have positive feelings about their relationship (Dewitte et al., 2015) when experiencing heightened passion for their partners and gratifying sex (Birnbaum et al., 2006; Debrot et al., 2017; Rubin & Campbell, 2012), even if only in their fantasies (Birnbaum, Kanat-Maymon, et al., 2019; Birnbaum, Mizrahi, et al., 2019). Overall, sexual satisfaction tends to generate an “afterglow” for as long as 48 h following sexual activity, thereby helping to maintain a sense of intimate connection between episodes of sexual interaction (Meltzer et al., 2017).

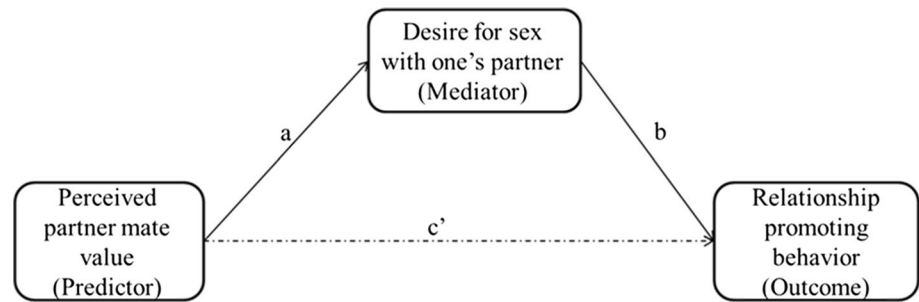
The Mate-Retaining Function of Sexual Desire

Sexual desire, however, is not always easily instigated, with many long-term relationships failing to sustain it (e.g., Birnbaum et al., 2007; McNulty et al., 2016; Michael et al., 1994). Acknowledging the contextual and dyadic nature of sexual desire (e.g., Basson, 2000; Diamond, 2012; Murray et al., 2012), scholars have conceptualized desire as being influenced by relational cues that indicate a partner's mate value (e.g., partners' suitability and regard; Birnbaum, 2018; Mark & Lasslo, 2018). In support of this reasoning, research has shown that behavioral cues that signal mate value, such as behaviors that are theorized to promote reproductive success via parental investment (e.g., provision of responsiveness and support; Li et al., 2002), increase partners' sexual desirability. Specifically, in a series of studies that observed partners' expressions of responsiveness and sexual desire during personal disclosures, responsive partners were perceived as more valued, and thus as more sexually desirable, mates (Birnbaum et al., 2016). For the same reasons, people tend to experience less desire for sex with existing partners whose behavior indicates that they are less likely to invest in the relationships. For example, both men and women experience less sexual desire for a partner whose regard for them is uncertain (Birnbaum et al., 2018).

These studies have supported a link between perceptions of partner mate value and sexual desire for the partner, demonstrating that partners who are perceived to be valued indeed arouse more sexual desire. Nevertheless, they did not examine the end products of this process, which should be manifested in the enactment of relationship-promoting behaviors. This is a key omission to theory in that desire for one's partner should serve a mate-retention function in relationship-development processes, encouraging investment in a partner who has high mate value and is thus perceived to be worth retaining. By enacting relationship-promoting behaviors, people can minimize the possibility that this valued partner would be susceptible to alternative partners.

Sexual desire may thus function as a key drive behind the link between partner mate value and relationship-promoting behavior. This implies, for example, that a lack of sexual desire for a partner may result from low mate value and therefore may inhibit investment in a relationship with this less-valued partner (Birnbaum, 2018; Buss et al., 2017). In contrast, heightened sexual desire may reflect high mate value and is therefore likely to motivate continuous investment in maintaining the relationship with this valued partner (Birnbaum, 2018; Birnbaum et al., 2016). Indeed, people are more likely to enact benefit-providing mate-retention behaviors (e.g., giving expensive gifts, paying compliments, prioritizing the partner's preferences over one's own) with a partner they perceive to be valued (Buss & Duntley, 2011;

Fig. 1 The theoretical mediation model showing that sexual desire mediates the association between perception of mate value and relationship-promoting behaviors



Buss & Shackelford, 1997) in an attempt to decrease the likelihood that this partner will defect from the relationship (Miner et al., 2009).

Conceptually, these studies are the first to draw an explicit, theoretically grounded link between mate value and sexual desire on the one hand, and relationship-maintenance behaviors on the other hand (see Fig. 1). Many existing models have theorized about the importance of sexual activity in relational bonding (e.g., Birnbaum, 2014; Diamond, 1998; Hazan & Zeifman, 1994) but none have empirically documented the role of sexual desire as a central motivational factor in this process. Moreover, although it is reasonably well-established that sexual desire is associated with positive relationship outcomes—for example, satisfaction and commitment (e.g., Acker & Davis, 1992; Birnbaum et al., 2007; Muise et al., 2013)—no existing studies of which we are aware have focused directly on specific relationship-maintenance behaviors.

Adding the desire-bonding link to models of mate value helps put the construct of sexual desire in context—that is, rather than using sexual desire as a starting point in this causal chain, our model begins with a conceptually prior and important determinant of sexual desire, a partner's perceived value as a mate. An individual's perceived mate value depends on many traits that are not necessarily sexual in nature (e.g., intelligence, trustworthiness, warmth; Fletcher et al., 1999; Tidwell et al., 2013). Our model suggests that these traits contribute to the individual's ability to attract mates and sustain a long-term relationship with them by means of instigating and maintaining high levels of sexual desire for them. By putting sexual desire into this more developed and dyadic context, we hope to shed light on the functional significance of sexual desire in relationship-maintenance process and explain why, when, and how desire (or lack of) helps build or destroy a relationship.

The Present Research

The present research sought to determine whether experiencing sexual desire for one's partner would increase the likelihood of behaviors that enhance the relationship with this partner, indicating that sexual desire functions as a mechanism

encouraging investment in partners who are perceived to be worth pursuing. Relying on the theoretical principle that sexual desire serves as a gauge of a partner's mate value that ensures that only relationships with valued partners will be sustained (Birnbaum, 2018; Buss et al., 2017), we predicted that experiencing heightened desire for one's partner would lead to greater efforts to maintain the romantic relationship with this partner. We also predicted that perceived partner mate value would drive this process, such that perceiving one's partner as more valued would foster increased desire for sex with this partner, which, in turn, would predict greater efforts toward maintaining the relationship, as manifested in relationship-promoting behavior.

Some readers might suggest an alternative to the proposed mediational model, reversing the roles of mate value and sexual desire (that is, positing perceived mate value as a mediator of the association between sexual desire and relationship-promoting behaviors). We think this ordering is less conceptually defensible than the one we tested. The construct of mate value, as it is represented in the traditional literature, is extrinsic to a relationship in that it denotes what one's partner would be worth to potential mates in the world of dating and matchmaking (e.g., Conroy-Beam et al., 2016). Sexual desire, in contrast, is intrinsic to a given relationship; one feels sexually attracted to a particular person or one does not. It therefore seems more parsimonious to posit sexual desire as a response to an available potential partner, one that directly predicts the extent to which a person will behave in ways designed to promote a relationship with that person. Notwithstanding this reservation, we tested this alternate model, as reported below.

Five studies tested these hypotheses. A pilot study was designed to establish a causal connection between experiencing sexual desire for one's partner and the willingness to engage in relationship-promoting behavior (presented as path b in the model; see Fig. 1). To do so, romantically involved participants recalled either a sexual or a neutral activity they experienced with their partner and then rated their desire to do something that would make their partner happy. Study 1 sought to replicate and extend the findings of the pilot study by investigating whether experiencing desire for one's partner during a face-to-face interaction with this partner leads

to actual enactment of relationship-promoting behavior (presented as path b in the model; see Fig. 1). For this purpose, couples relived a shared positive experience that was either sexual or non-sexual. Then, one partner disclosed a recent personal event and rated the other partner's responsiveness to this discourse. Participants' enacted responsiveness was also evaluated by judges.

Using experimental, daily experiences, and longitudinal methods, Studies 2, 3, and 4 aimed to investigate whether manipulation or perceptions of partner mate value motivate the expected effect of desire on engagement in relationship-promoting behavior (see Fig. 1). Specifically, in Study 2, partnered participants recalled an event in which they either highly valued or less valued their partner and then rated their sexual desire for their partner. At the end of the experiment, participants indicated the number of spa treatments they would transfer to their partner in case of winning a lottery that was conducted at the end of the study (i.e., an index of relationship-promoting behavior).

Study 3 set out to examine whether the expected effects of sexual desire generalize to everyday life and would manifest in actual relationship-promoting behaviors. Both members of romantic couples completed daily measures of perceived partner mate value, sexual desire, and relationship-promoting behaviors over a span of 42 consecutive days. Finally, Study 4 used a longitudinal design to explore whether the proposed model would extend to other, more costly relationship-promoting behaviors that play a key role in supporting long-term bonding (and that were not assessed in Study 3). Specifically, at monthly intervals over the course of 6 months, both members of dating couples reported on their partner's mate value, feelings of passion for their partner, and sacrifices for their partner. All data were collected before any analyses were conducted; all measures, manipulations, and exclusions in these studies are disclosed, as well as the method of determining the final sample size.

Pilot Study

In this pilot study, we sought to confirm a causal link between experiencing sexual desire for one's partner and the desire to engage in relationship-promoting behavior. For this purpose, we employed an experimental design in which romantically involved participants were asked to recall either a sexual or a neutral activity with their partner and to describe that experience in narrative form. Then, participants rated their desire to engage in sex with their partner and to do something that would make their partner happy. The desire to do something nice for the partner likely indicates partner-focused approach motivation, which has been shown to have beneficial effects for the relationship (e.g., Clark et al., 2010). We hypothesized that participants would report greater desire to do something that would make their partner happy in the

shared sexual activity condition than in the shared neutral activity condition.

Method

Participants

A total of 130 (66 women, 64 men) from a university in central Israel volunteered for the study without compensation. Sample size was determined via a priori power analysis using G*Power software package (Faul et al., 2009) to ensure 80% power to detect an effect size, d , of 0.50 at $p < .05$. This hypothesized effect size was based on findings from previous research examining the effect of activation of the sexual system on relationship-promoting behavior in initial encounters (Birnbaum et al., 2017). Potential participants were recruited if they were in a steady, heterosexual, and monogamous relationship of longer than 4 months. Participants ranged from 21 to 34 years of age ($M = 25.10$, $SD = 2.87$). Relationship length ranged from 4 to 216 months ($M = 40.96$, $SD = 36.54$). No significant differences were found between the experimental conditions for any of the socio-demographic variables.

Measures and Procedure

Participants who agreed to participate in a study on mutual activities were individually scheduled to attend a single half-hour laboratory session. Prior to each session, participants were randomly assigned to one of two conditions: Recalling either a sexual or a neutral activity with their partner. Upon arrival at the laboratory, participants were greeted by a research assistant (all communication was done in Hebrew). Then, participants were instructed to recall an activity they experienced with their current partner and to describe in narrative form their experience when they had it in mind. Instructions for the sexual experience condition were as follows: "Please recall a pleasant sexual interaction you have experienced recently with your partner and write about it in the space below. Please describe in detail the specific scene, wishes, sensations, feelings, and thoughts that were experienced by you and your partner. At this point, we wish to note that you are writing anonymously, so feel free to write anything you like." Instructions for the neutral experience condition were similar, except that the participants were asked to recall a time when they discussed a neutral topic that did not arouse extreme emotions (e.g., shopping list, which movie to see next) with their partner. For example, some participants wrote about discussing with their partner their day at work or their plans for the weekend.

After describing their experience, participants were instructed to think about how they felt right then and to complete three items assessing their sexual desire for their partner

Table 1 Means, standard deviations, statistics, and effect sizes of desire for engaging in sex and relationship-promoting behavior for the sexual and non-sexual conditions (pilot study)

	Sexual experience		Non-sexual experience		$t_{(128)}$	Cohen's d	95% CI for Cohen's d
	M	SD	M	SD			
Sexual desire	4.78	0.99	3.80	1.03	5.52***	.97	[.60, 1.33]
Relationship-promoting	4.97	1.19	4.30	1.25	3.10**	.54	[.19, .89]

** $p < .01$, *** $p < .001$; Items were rated on a 7-point Likert scale

(e.g., “I feel a great deal of sexual desire for my partner”; “I am passionately attracted to my partner”). These items were adapted from the sexual desire scale used by Birnbaum et al. (Study 3; 2016) to reflect current experiences of desire. The three items were internally reliable ($\alpha = 0.74$) and were thus averaged to form a global sexual desire index. Participants also completed three items assessing their desire to do something that would make their partner happy (“I desire to do something that would make my partner happy”; “I desire to do things with my partner that my partner really enjoys”; “I desire to do something that would make my partner feel loved”; $\alpha = 0.71$). Ratings were made on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much so*). Finally, participants were asked to provide demographic information (e.g., age, relationship length) and were then fully debriefed.

Results and Brief Discussion

Manipulation Check

A t test on the desire for sex with one's partner yielded the expected effect. Participants reported significantly greater desire to have sex with their partner in the sexual condition than in the non-sexual condition (see Table 1).

The Effect of Sexual Desire on the Desire to Engage in Relationship-Promoting Behavior

A t test on the desire to engage in relationship-promoting behavior yielded the expected effect. Participants reported significantly greater desire to engage in relationship-promoting behaviors in the sexual condition than in the non-sexual condition (see Table 1). No significant effect was found for gender, nor for the sexual desire by gender interaction, in predicting the desire to engage in relationship-promoting behavior.

The pilot study demonstrated that experiencing sexual desire for one's partner is causally responsible for instigating the desire to enact behavior that would make this partner happy. Sexual desire for current partners thus apparently tends to spill over outside the bedroom, enhancing the willingness to employ strategies that allow individuals to get closer to their partners and improve their relationships. This

conclusion, however, should be viewed with caution, as it is unclear whether the reported desire to enact behavior that would make one's partner happy would translate into actual behavior. Furthermore, this study cannot rule out the possibility that experiencing any shared positive activity with one's partner, even if it is not necessarily sexual in nature, would yield similar beneficial effects. Relatedly, the recollection of sexual experience with one's partner might have primed thoughts about the partner having done something nice for oneself, motivating reciprocity rather than sexual desire as having driven the effects. Finally, the items we used to assess the desire to do something that would please one's partner were generic, such that participants in the sexual condition might have interpreted these items in terms of doing something nice for their partner in the sexual domain rather than in the more general, non-sexual domain. Study 1 addressed these limitations.

Study 1

Study 1 set out to replicate and extend the findings of the pilot study in two ways. First, we wished to demonstrate that sexual desire for one's partner not only heightens the desire to make this partner happy but also translates into actual behavior within a dyadic context. In doing so, we considered whether the effect of experiencing sexual desire on self-reported partner responsiveness would match its effect on behavioral expressions of responsiveness, as rated by independent coders. Second, we sought to clarify whether the beneficial relationship effect of reliving a shared positive experience with one's partner is exclusive to the sexual realm rather than to any shared positive experience.

To do so, we used a live interaction paradigm in which romantic couples relived a recent shared positive experience that was either sexual or non-sexual. Following this interaction, one partner (the discloser) disclosed to the other partner (the responder) a recent positive event while being videotaped and rated the partner's responsiveness to this disclosure. These interactions were coded by two trained independent judges for expressions of partner responsiveness. We focused on provision of responsiveness because such behavioral expressions of caring and concern play a key role in supporting long-term bonding and signal that a partner is willing to invest resources in the relationship and can be

counted on to reliably support personal needs (Birnbaum & Reis, 2012; Clark & Lemay, 2010; Reis & Clark, 2013). We hypothesized that partners would provide more responsiveness, as perceived by the disclosers, in the sexual activity condition than in the non-sexual activity condition.

Method

Participants

A total of 198 heterosexual individuals (99 couples) participated in this study in exchange for 100 NIS (about \$30 US). Originally, we sought a similar number of participants per condition as in the pilot study, based on a similar power analysis. However, recruitment difficulties, combined with the need to complete the recruitment process before the end of the academic year, led us to end the study prematurely and we decided to analyze and report the data at that stage. All couples were recruited via flyers or by word of mouth from universities, colleges, community centers, and sport clubs in the central area of Israel. Potential participants were recruited if they were in a steady, heterosexual, and monogamous relationship of at least 4 months. Women ranged in age from 19 to 33 years ($M = 24.72$, $SD = 2.73$). Men ranged in age from 20 to 37 years ($M = 26.57$, $SD = 3.21$). Forty-eight percent of the couples were cohabiting and 12% were married. Six percent had children. Relationship length ranged from 4 to 367 months ($M = 37.84$, $SD = 43.21$).

Measures and Procedure

Couples who agreed to participate in a study of intimate interactions were individually scheduled to attend a single half-hour laboratory session. Prior to each session, couples were randomly assigned to discuss a shared positive experience that was either sexual or non-sexual. When each dyad arrived at the laboratory, they were greeted by a research assistant who explained that the study involved discussing a recent shared positive experience (all communication was done in Hebrew). Then, couples were asked to describe their first date in an unstructured discussion for up to 5 min. This interaction was designed to make couples feel comfortable in the laboratory and was not rated. Next, couples were instructed to discuss either a shared sexual experience or a shared non-sexual experience.

Instructions for the sexual experience discussions were as follows: “We would like you to choose one of the most positive sexual interactions you have experienced together in recent years and discuss its details. To help you relive the experience, please first try to imagine yourself and your partner during this interaction as vividly as possible, as though you are experiencing the same interaction over again, and

discuss in detail the specific scene, wishes, sensations, feelings, and thoughts you experienced: The smell of your partner, your partner’s touch, what exactly your partner did that turned you on. While discussing this interaction, please focus on the small details that made the experience so good: How it all began, what exactly happened there, what your partner told you during sex, what aroused you sexually.”

Instructions for the positive non-sexual experience discussions were similar, as follows: “We would like you to choose one of the most positive interactions you have experienced together in recent years and discuss its details. To help you relive the experience, please first try to imagine yourself and your partner during this interaction as vividly as possible, as though you are experiencing the same interaction over again, and discuss in detail the specific scene, wishes, sensations, feelings, and thoughts you experienced: What exactly you and your partner did that made you both feel good. While discussing this interaction, please focus on the small details that made the experience so good: How it all began, what exactly happened there, what your partner told you during this experience, what made you happy.” Couples discussed, for example, attending a dance class together, collaborating on an art project together, or an exciting trip or a workshop they took together. No couple in the control condition discussed a positive sexual experience.

All discussions lasted 7–10 min. After the discussion, partners were led into separate rooms to ensure confidentiality. Partners were asked to think about how they felt right then and to complete three items assessing their sexual desire for each other, described in the pilot study ($\alpha = 0.72$). These items were intermingled with four filler questions assessing interest in shared neutral activities (e.g., “To what extent would you be interested in watching a movie with your partner now?”) to mask our interest in sexual desire. Ratings were made on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much so*).

Upon completion of the questionnaire, partners were reunited and followed the procedure of Birnbaum et al. (2016, Study 2). Specifically, couples were randomly assigned to the role of discloser or responder by flipping a coin. Following procedures for studying supportive responses to personal event disclosures (Gable et al., 2006), disclosers were instructed to discuss a recent personal positive event (e.g., receiving a good grade in a class, a work promotion) of their choosing. Responders were asked to respond to, add to, or talk about as much or as little as they would under normal circumstances. All discussions, which lasted between 5 and 7 min, were videotaped by two cameras mounted in the corners of the room, with one camera pointed at each partner at an angle to allow for full frontal recording.

After the discussion, partners were again led into separate rooms to ensure confidentiality. Disclosing partners completed 9 items of the Hebrew version of a measure of

Table 2 Means, standard deviations, statistics, and effect sizes of desire for engaging in sex, desire to engage in neutral activities, and perceived partner responsiveness for the sexual and non-sexual conditions (Study 1)

	Sexual experience		Non-sexual experience		$t_{(97)}$	Cohen's d	95% CI for Cohen's d
	M	SD	M	SD			
Disclosers' desire	3.50	0.97	2.84	1.18	3.06**	.62	[.21, 1.02]
Responders' desire	3.56	0.78	2.85	.88	4.27***	.86	[.44, 1.27]
Neutral activities	2.45	0.61	2.52	.61	-0.62	-.12	[.00, .50]
Enacted Responsiveness	3.59	0.66	2.99	.81	4.00***	.80	[.39, 1.21]
Perceived responsiveness	3.50	0.74	3.10	.87	2.23*	.45	[.05, .85]

* $p < .05$, ** $p < .01$, *** $p < .001$; Items were rated on a 5-point Likert scale

responsiveness (Birnbaum & Reis, 2012), adapted from the Perceived Responsiveness Scale to assess perceptions of how understood, validated, and cared for the discloser felt when interacting with the responder (Reis et al., 2018). Items (e.g., “My partner was aware of what I am thinking and feeling”; “My partner really listened to me”) were rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). The scale was factorially unidimensional and internally consistent ($\alpha = 0.89$) in our sample. Higher scores indicated greater perceived responsiveness. Responding partners did not complete this measure of responsiveness. Finally, both partners were asked to provide demographic information (e.g., age, relationship length) and were then fully debriefed. No couple left until the research assistant was convinced that both partners felt good about their participation in the study. The data collection ran from March 2011 to June 2011.

Coding of Partner's Enacted Responsiveness during the Discussion

Two judges (psychology students) independently watched and rated each couple's discussion. The judges were blind to the hypotheses, to the experimental condition, and to participants' responses. Judgments of enacted responsiveness were thus not influenced by the recipient's response. Judges were pre-trained on the rating procedure, which was based on Maisel et al.'s (2008) coding system. This coding system operationalizes responsive behaviors as behaviors that signal understanding (i.e., listening, gathering information, and getting the facts right), validation (i.e., reinforcing the partner's self-views and making the partner feel valued and respected), and caring (i.e., communication of feelings of affection for one's partner). Judges rated the extent to which the responding partner employed each of these three strategies in the interaction, using a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*a great deal*). The intraclass correlation (ICC) for each item was as follows: understanding = 0.77, validation = 0.75, caring = 0.75. We therefore averaged the two judges' scores to create measures of understanding, validation, and caring. Scores on these three measures were highly correlated (all $r_s > 0.70$, all $p_s < .001$). Following Maisel

et al. (2008), we used a composite score for global responsive behaviors (average of understanding, validation, and caring) in subsequent analyses.

Results and Brief Discussion

Manipulation Check

A t test on desire for sex with one's partner yielded the expected effect. Both disclosers and responders reported significantly greater desire to have sex with their partner in the sexual condition than in the non-sexual condition (see Table 2).

The Effect of Sexual Desire on Enacted and Perceived Partner Responsiveness

A t test on enacted and perceived partner responsiveness yielded the expected effect. Disclosing partners reported that responding partners were significantly more responsive in the sexual condition than in the non-sexual condition. Judges also rated responding partners as significantly more responsive in the sexual condition than in the non-sexual condition. As expected, a t test on desire to engage in neutral activities with one's partner did not yield a significant effect (see Table 2). To verify that the non-significant effect of sexual experience on desire to engage in neutral activities was significantly different from the significant effect of sexual experience on enacted responsiveness, we conducted a 2 (Type of experience: sexual, not sexual) \times 2 (type of activity: enacted responsiveness, neutral) analysis of variance (ANOVA), with repeated measures on the second factor. This analysis yielded a significant interaction between the type of experience and the type of activity, $F(1, 97) = 12.52$, $p < .001$, $Partial-\eta^2 = 0.114$, 90% CI [0.02, 0.24], indicating that reliving shared sexual experiences, which promoted desire for sex with one's partner, encouraged enactment of non-sexual relationship-promoting behavior, but did not affect participants' interest in other, less beneficial, activities. No significant effect was found for gender, nor for the sexual desire

by gender interaction, in predicting enacted and perceived partner responsiveness.

Study 1 replicated the findings of the pilot study and extended them by indicating that reliving shared sexual experiences led to actually enacting more responsiveness, a relationship-promoting behavior, to this partner's disclosures during face-to-face interactions. The findings also demonstrated that the beneficial effects of shared positive experiences with one's partner were unique to the sexual realm, such that re-experiencing a sexually desirable activity with one's partner increased the likelihood of engaging in relationship-promoting behavior outside the bedroom as compared with re-experiencing a positive, but non-sexual, activity with one's partner. These findings warrant caution, however, as we cannot rule out the possibility that recalling a sexual experience together was just as positive as recalling a non-sexual experience together. In addition, the present sample included couples who agreed to participate in a study of intimate interactions and thus it is important to acknowledge the possibility of participation bias (see review by Catania et al., 1990). The findings are also confined to a laboratory setting, which may compromise their ecological validity. Finally, the findings do not reveal what motivates the effect of experiencing sexual desire for one's partner on behaving in a relationship-promoting manner. The latter two limitations are addressed in the next studies.

Study 2

Study 2 introduced the concept of partner mate value to this research, specifically as an antecedent of the expected association of sexual desire for one's partner with engagement in relationship-promoting behaviors. In particular, Study 2 aimed to establish a directional association between partner mate value and sexual desire and to demonstrate that high partner mate value instigates sexual desire and thereby motivates investment in maintaining the relationship with this partner, as manifested in relationship-promoting behavior. To do so, romantically involved participants recalled an event in which they either highly valued or less valued their partner. Then, participants rated the extent to which they experienced sexual desire for their partner and marked how many spa treatments (out of 5) they wished to transfer to their partner in case of winning a lottery that was conducted at the end of the study. The transferred number of spa treatment was used as an index of relationship-promoting behavior. This outcome measure was more concrete and objective than the responsiveness assessed in Study 1. We hypothesized that recalling an event in which one's partner was valued would lead to experiencing heightened sexual desire, which, in turn, would predict transferring more spa treatments to this partner.

Method

Participants

A total of 202 Israeli participants (103 women, 99 men) volunteered for the study. Following Fritz and MacKinnon's (2007) suggestion, sample size was determined via a priori power analysis using PowMedR in R (Kenny, 2013) to ensure 80% power to detect a medium effect size (0.30 in a correlation metric) for both paths a and b in a mediation analysis. Potential participants were recruited if they were in a steady, heterosexual, and monogamous relationship of longer than 4 months. Participants ranged from 19 to 60 years of age ($M = 36.96$, $SD = 10.26$). Relationship length ranged from 8 to 528 months ($M = 128.88$, $SD = 117.53$). No significant differences were found between the experimental conditions for any of the socio-demographic variables.

Measures and Procedure

Participants who wished to take part in a study of experiences in romantic relationships were given a link to an online Qualtrics experiment. After completing an online consent form, participants read the following introductory text (all communication was done in Hebrew): "Over the course of romantic relationships, people tend to experience ups and downs in perceptions of their partner's value, such that sometimes they may highly value their partner, seeing him or her as a supportive, successful, and high-quality partner, and sometimes they may perceive him or her in less positive terms." Participants were then randomly assigned to one of two conditions: Recalling an event in which they either highly valued or less valued their partner.

Participants in the high partner mate-value condition were instructed to recall an event that made them highly value their partner and perceive him or her as someone that others would also view as a valued and desirable partner. Participants in the lower partner mate-value condition were instructed to recall an event that made them value their partner less and perceive him or her as someone that others would also view as a less-valued and desirable partner. Participants in both conditions were asked to describe in detail the specific scene, wishes, feelings, and thoughts that were experienced by them and their partner.

After describing the event, participants were instructed to think about how they felt right then and to complete six items assessing their perceptions of their partner's desirability as a mate (Birnbaum et al., 2016, e.g., "My partner would be perceived as an extremely desirable mate by other people"; "If my partner were single, he would have been romantically pursued by opposite-sex individuals"; $\alpha = 0.87$) and three items assessing their sexual desire for their partner ($\alpha = 0.83$),

Table 3 Means, standard deviations, statistics, and effect sizes of perceived partner mate value, sexual desire, and relationship-promoting behavior for the high and low partner mate value conditions (Study 2)

	High mate value		Low mate value		$t_{(200)}$	Cohen's d	95% CI for Cohen's d
	M	SD	M	SD			
Partner mate value	4.38	0.50	3.26	.88	11.29***	1.60	[1.28, 1.92]
Sexual desire	4.19	0.89	3.81	1.02	2.82**	.40	[.12, .68]
Promoting behavior	4.15	0.98	3.63	1.32	3.23***	.46	[.18, .74]

** $p < .01$, *** $p < .001$; Items were rated on a 5-point Likert scale

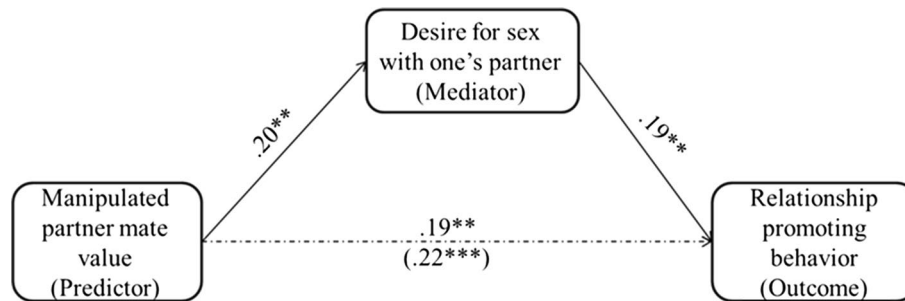


Fig. 2 Mediation model showing that desire for sex with one's partner mediated the association between manipulated partner mate value and relationship-promoting behavior in Study 2. Note: Path

coefficients are standardized. The value in parentheses is from the analysis of the effect without desire for one's partner in the equation. ** $p < .01$, *** $p < .001$

described in the pilot study. Ratings were made on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much so*). Participants were then informed that they would participate in a lottery in which they could win 5 spa treatments and were asked to report how many of them should be transferred to their partner in case of winning. The number of spa treatments transferred to one's partner (ranges from 0 to 5) served as an index of relationship-promoting behavior. Finally, participants provided basic demographic information (e.g., age, relationship length). The data collection ran from July 2019 to August 2019.

Results and Discussion

Manipulation Check

A t test on perception of partner mate value yielded the expected effect. Participants perceived their partner as significantly more valued in the high mate value condition than in the low mate value condition (see Table 3).

Preliminary Analysis

As expected, perceived partner mate value was correlated positively and significantly with sexual desire, $r = .37$, $p > 0.001$, and relationship-promoting behavior, $r = .40$, $p < .001$. Sexual desire was correlated positively and

significantly with relationship-promoting behavior, $r = .22$, $p < .001$.

The Effect of Partner Mate Value on Desire and Relationship-Promoting Behavior

t tests on sexual desire and relationship-promoting behavior yielded the expected effect. Participants reported significantly greater sexual desire for their partner and engagement in relationship-promoting behavior in the high mate value condition than in the low mate value condition (see Table 3). No significant effect was found for the mate value by gender interaction in predicting sexual desire and engagement in relationship-promoting behavior.

To examine whether the effect of manipulated partner mate value on relationship-promoting behavior was mediated by desire for sex with one's partner, we used PROCESS (Hayes, 2013, model 4), in which partner mate value was the predictor, relationship-promoting behavior was the outcome measure, and desire for sex with one's partner was the mediator. Figure 2 shows the final model. This analysis revealed a significant effect of manipulated partner mate value on desire for sex with one's partner ($b = 0.38$, $SE = 0.13$, $t = 2.82$, $p = 0.005$, $\beta = 0.20$, 95% CI for β [0.06, 0.34]). The analysis further revealed a significant effect of desire for sex with one's partner on relationship-promoting behavior ($b = 0.27$, $SE = 0.08$, $t = 3.24$, $p < .001$, $\beta = 0.22$, 95% CI for β [0.08, 0.36]), such that participants who perceived their partner as

more valuable were more likely to engage in relationship-promoting behavior.

Desire for sex with one's partner was also uniquely associated with relationship-promoting behavior after controlling for partner mate value ($b = 0.23$, $SE = 0.08$, $t = 2.70$, $p = 0.008$, $\beta = 0.19$, 95% CI for β [0.05, 0.33]). Finally, results indicated that the 95% CI of the indirect effect for manipulated partner mate value as a predictor of relationship-promoting behavior through desire for sex with one's partner did not include zero and thus is considered significant ($b = 0.09$, $SE = 0.05$, $\beta = 0.04$, 95% CI for β [0.01, 0.09]). Hence, the analyses support an indirect effect of partner mate value on relationship-promoting behavior, such that manipulated partner mate value heightened sexual desire for this partner, which, in turn, predicted greater engagement in relationship-promoting behavior. Neither gender nor relationship length moderated these effects.

Study 2 extends the findings of Study 1 by showing that the effect of experiencing sexual desire for one's partner is not limited to provision of responsiveness but covers other, more concrete relationship-promoting behaviors that are likely to make one's partner happy. Study 2 also demonstrates the utility of our mediation model, indicating that perceptions of partner mate value propel the proposed process and determine investment in current relationships by affecting levels of desire for this partner. By doing so, Study 2 supports the conceptualization of sexual desire as context dependent (Basson, 2000; Birnbaum, 2018; Mark & Lasslo, 2018), showing how the relational context may guide the experience of desire and its functional significance. And yet, given that sexual desire and engagement in relationship-promoting behavior were assessed roughly at the same moment in time, this analysis is merely compatible with the mediation model tested and there are other possible models (e.g., a reversed mediation). Furthermore, for some people, giving their partner a spa treatment might not be relationship promoting because not all people like spa treatments. Studies 3 and 4 addressed these limitations. Overall, Study 2 puts sexual desire into context and thereby sheds light on why and how sexual desire may foster relationship development as much as its absence can impair it.

Study 3

In Study 3, we employed a daily experience methodology to provide a more naturalistic and contextually informed view of how perceptions of partner mate value, experiences of sexual desire for one's partner, and engagement in relationship-promoting behaviors unfold over time. Specifically, for 6 weeks, we asked both members of 100 romantic couples to complete a nightly diary in which they recorded the quality of their relationship that day, their perceptions of partner mate value, as well as their desire for sex with their partner

and engagement in relationship-promoting behaviors. We predicted that the association between daily perception of partner mate value and daily engagement in relationship-promoting behaviors would be mediated by daily sexual desire, such that on a given day, participants who perceived their partner as more valued would experience increases in sexual desire for their partner and, in turn, would be more likely to engage in relationship-promoting behavior (as reported by their partner). Importantly, because participants' reports of their own relationship-promoting behavior might be correlated with their ratings of perceived mate value and sexual desire due to response consistency or motivated construal, we used partner reports of relationship-promoting behavior as the primary outcome variable.

Method

Participants

A total of 100 heterosexual Israeli couples participated in exchange for 400 NIS (about \$105 US).¹ Power was determined using the PinT V2.1 computer program (Bosker et al., 2003). Power for a random coefficient model was estimated for a sample of 100 couples and 42 time periods, with a moderate effect size (0.30 in a correlation metric), and yielded a power of 0.99. All couples were recruited via flyers or by word of mouth from universities, colleges, community centers, and sport clubs in the central area of Israel. Potential participants were recruited if they (a) were in a steady monogamous relationship; (b) were currently sexually active (defined as having had vaginal sex at least twice a week in the 2 months preceding the study). Women ranged in age from 21 to 31 years ($M = 23.93$, $SD = 1.84$) and men ranged in age from 21 to 35 years ($M = 25.60$, $SD = 2.70$). Ninety-five percent of the couples were cohabiting and 5% were married. Two percent had children. Relationship length ranged from 1 to 98 months ($M = 24.80$, $SD = 25.67$).

Measures and Procedure

Couples who fulfilled the inclusion criteria were invited to the laboratory, filled out a background questionnaire, and were trained on completing the diary questionnaires (all communication was done in Hebrew). Participants were instructed to fill out the questionnaires independently and to refrain from discussing responses with their partner until completion of the study. Emails containing a link to the daily-level measures were sent independently to both partners each day for 42 days. We contacted couples by telephone every

¹ Participants were part of a larger project (see Birnbaum et al., 2016).

week to improve compliance with the diary protocol. At the end of the study, both partners were debriefed and thanked for their participation. The data collection ran from November 2013 to May 2014.

Daily-Level Measures

On each diary day, participants completed measures of perceptions of partner mate value, sexual desire for their partner, relationship-promoting behaviors, and relationship quality. All daily items were rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). Given that the traditional Cronbach's alpha is not suitable for calculating inter-item reliability in nested data, we followed guidelines suggested by Nezlek (2012) to estimate scale reliability. Specifically, in addition to the hierarchical levels of days and person, we created a third lower level that captures inter-item variability. We then ran a 3-level unconditional model in HLM 7 software (Raudenbush et al., 2011) that estimates lower-level data reliability, which is equivalent to Cronbach's alpha (Nezlek, 2012).

Perceived Partner Mate Value

Participants completed six items assessing their daily perceptions of their partner's desirability as a mate (Birnbaum et al., 2016; "My partner would be perceived as an extremely desirable mate by other people"; "If my partner were single, he would have been romantically pursued by opposite-sex individuals"; "Other people would perceive my partner as an ideal mate"; "Today I perceived my partner as a very valuable mate"; "Today I perceived my partner as a very successful person"; "My partner has been charming and charismatic today"; $\alpha = 0.80$).

Sexual Desire

We used five items in which participants rated their sexual desire for their partner during that day (Birnbaum et al., 2016, e.g., "I felt a great deal of sexual desire for my partner today"; "I was very interested in having sex with my partner today"; $\alpha = 0.86$).

Relationship-Promoting Behaviors

Participants completed four items assessing the extent to which their partner had behaved positively toward them on that day (Birnbaum et al., 2006; "My partner behaved affectionately and warmly toward me today"; "My partner behaved thoughtfully toward me today"; "My partner behaved in a caring manner towards me today"; "My partner took care of my needs today"; $\alpha = 0.82$). To rule out response consistency or a motivated construal process explanation (Reis &

Gable, 2000), the outcome of interest was partners' reports of relationship-promoting behaviors, which indicated whether participants perceived their partners having enacted these behaviors directed toward them.

Relationship Quality

Participants rated the quality of their relationship with their partner on each day. Ratings were made on a 5-point scale, ranging from (1) "poor" to (5) "excellent."

Results and Brief Discussion

Preliminary Analyses

We used participant's average across all days (person mean) and correlated them. As expected, perceived partner mate was correlated positively and significantly with sexual desire, $r = .71, p < 0.001$, and relationship-promoting behavior, $r = .37, p < .001$. Sexual desire was correlated positively and significantly with relationship-promoting behavior, $r = .36, p < .001$. The pattern of within-person correlations (the average of the correlations within each person across the diary days) was similar: Perceived partner mate was correlated positively and significantly with sexual desire, $r = .32, p > 0.001$, and relationship-promoting behavior, $r = .30, p < .001$. Sexual desire was correlated positively and significantly with relationship-promoting behavior, $r = .32, p < .001$.

Main Analysis

A two-intercept, two-level hierarchical model for dyadic diary data was used to account for the nested structure of these data. The two-intercept approach simultaneously estimates unique intercepts and slopes for both male and female partners (Kenny et al., 2006). In the hierarchical model, Level 1 captures within-person variability across days, whereas Level 2 represents between-couple variability across partners (see Laurenceau & Bolger, 2005; Raudenbush et al., 1995, for more details). This analytic approach allows the error terms at Level 1 to correlate simultaneously across partners and days (Bolger & Laurenceau, 2013).

All analyses included four sets of controls. First, to control for time-related artifacts, the elapsed time in days was included as a linear trend, centered on the middle of the time span (i.e., Day 22). Second, to rule out serial dependency in the mediator and outcome variable, we controlled for these previous day's variables. For example, in predicting today's relationship-promoting behaviors, yesterday's relationship-promoting behaviors were partialled out. Third, we controlled for daily relationship satisfaction to better identify unique effects of the variables in interest over and above the general

affective tone of the relationship. Specifically, we controlled for the participant's relationship satisfaction when predicting the participant's desire (the mediator) and the partner's relationship satisfaction when predicting partner's relationship-promoting behaviors (the outcome). Last, as advocated by Bolger and Laurenceau (2013), we controlled for between-person averages (e.g., the average self-reported mate value aggregated across all 42 diary days) for all primary predictors. Also, because we focused on the day-to-day level, all within-person predictors were person-mean-centered.

Results of this analysis are presented in Table 4. The top section presents the association between perceived partner mate value and relationship-promoting behaviors. These results indicate that for both men and women, daily perceived partner mate value was positively linked with partners' reports of one's relationship-promoting behaviors. This link was statistically significant controlling for the effects of time, relationship satisfaction, yesterday's relationship-promoting behaviors, and each person's mean-level of mate value. The middle section of Table 4 reports the association between perceived partner mate value and sexual desire (the mediator). These results indicate that for both male and female partners, daily perceived partner mate value was positively associated sexual desire. In the bottom section of Table 4, we examined the association between daily sexual desire (the mediator) and partners' reports of one's relationship-promoting behaviors while also controlling for perceived partner mate value. These results show that for both romantic partners, sexual desire was positively linked with having enacted relationship-promoting behaviors (as seen by the partner).

Figure 3 presents results for the test of our proposed mediation model. Participants' perceived partner mate value was positively associated with sexual desire. In turn, sexual desire was significantly linked with partners' reports of participants' relationship-promoting behaviors. Direct links between perceived partner mate value and relationship-promoting behaviors were also observed. The significance of the indirect effect was estimated by the 95% Monte Carlo confidence intervals (MacKinnon et al., 2004). Results indicated that the 95% CI of the indirect effects for perceived partner mate value as a predictor of relationship-promoting behaviors through sexual desire did not include zero and thus can be considered significant (women's indirect effect = 0.10, 95% CI [0.08, 0.11]; men's indirect effect = 0.08, 95% CI [0.06, 0.10]; Tingley et al., 2014). Although the effect is consistent for men and women, we followed Bolger and Laurenceau's (2013) recommendation of using a model that is distinguished by gender rather than an indistinguishable model. This model allowed us to better estimate the interdependence between partners over time (i.e., the model estimated day-specific sources of dependency by allowing the male partner's residual on a given day to be correlated with the female partner's residual on that day).

Because the prior analyses were conducted on same-day variables, it is possible that desire and relationship-promoting behavior predicted perceived partner mate value, rather than the reverse, and theoretically preferred, model. To rule out this possibility, we tested a lagged model in which daily perceived partner mate value predicted the following day's desire and relationship-promoting behaviors over and above previous day's outcome variable and relationship satisfaction. Results indicated that for men, partner mate value predicted the following day's desire ($b = 0.07$, $SE = 0.03$, $p = 0.042$), which, in turn, was associated with relationship-promoting behaviors ($b = 0.14$, $SE = 0.02$, $p < .001$). The CI of this indirect effect (95% CI = 0.002, 0.019) indicated that desire significantly mediated the effect of men's perceived partner mate value on relationship-promoting behaviors. For women, partner mate value did not predict the following day's desire ($b = -0.01$, $SE = 0.03$, $p = 0.798$). Still, desire was associated with relationship-promoting behaviors ($b = 0.15$, $SE = 0.02$, $p < .001$). This indirect effect was not significant, however (95% CI = -0.011, 0.007).²

These findings are consistent with the idea that women's desire is more multifaceted than that of men in that it is determined by a myriad of dyadic factors, such as relational strife and emotional intimacy (Birnbaum et al., 2016; Mark & Lasslo, 2018). Bear in mind, however, that these lagged analyses are weaker than the prior same-day analyses, which showed similar effects for both men and women. This is because the relevant effects could wear off overnight as sleep and the new day's events may influence the desire to have sex with one's partner. Of course, same-day analyses also have limitations. For example, same-day effects of perceived mate value on desire may reflect the influence of a third variable (e.g., relational conflict, perceived partner responsiveness, negative external circumstances) or a reverse causal effect, such that sexual desire affects women's perceptions of men's mate value. Study 4 addressed these limitations.

In sum, we found that on days in which participants perceived their partner as more valued, they also experienced more sexual desire for their partner. This heightened sexual desire for one's partner, in turn, predicted greater engagement in relationship-promoting behaviors, as seen by partners. Overall, Study 3 demonstrated that the findings of the pilot study and Studies 1 and 2 generalize to everyday life, even when controlling for relationship quality, further illustrating the unique role of sexual desire in sustaining long-term relationships. Perceiving a current partner as more valued apparently makes this partner more sexually appealing, further

² Because the lagged effect of partner mate value on the following day's desire for men was marginally different from the same effect for women ($b = .02$, $SE = .01$, $p = .076$), we did not combine these effects.

Table 4 Direct and indirect effects of mate value on relationship-promoting behaviors through desire: unstandardized dyadic analyses coefficients (Study 3)

Effects	<i>B</i>	SE	<i>t</i>	<i>p</i>	95% CI	
<i>Dependent variable model (DV=Relationship-promoting behaviors)</i>						
W. Intercept	4.079	0.055	74.59	<.001	3.970	4.187
M. Intercept	4.354	0.045	96.64	<.001	4.265	4.444
W. Mate value	0.192	0.025	7.78	<.001	0.143	0.241
M. Mate value	0.158	0.027	5.86	<.001	0.105	0.212
W. Time	0.001	0.001	0.99	.321	− 0.001	0.002
M. Time	0.001	0.001	0.88	.381	− 0.001	0.002
W. RPB (yesterday)	− 0.019	0.017	− 1.12	.265	− 0.053	0.015
M. RPB (yesterday)	0.007	0.014	0.52	.605	− 0.021	0.036
W. Satisfaction	0.483	0.030	16.23	<.001	0.423	0.542
M. Satisfaction	0.557	0.025	22.26	<.001	0.507	0.607
Mean W. Mate value	0.422	0.090	4.67	<.001	0.243	0.601
Mean M. Mate value	0.408	0.066	6.16	<.001	0.277	0.539
<i>Mediator variable model (DV=Desire)</i>						
W. Intercept	3.832	0.051	75.08	<.001	3.731	3.933
M. Intercept	3.906	0.045	87.15	<.001	3.817	3.995
W. Mate value	0.772	0.035	22.30	<.001	0.703	0.841
M. Mate value	0.749	0.047	15.88	<.001	0.655	0.843
W. Time	0.001	0.001	0.90	.369	− 0.001	0.003
M. Time	0.001	0.001	0.67	.502	− 0.001	0.003
W. RPB (yesterday)	− 0.052	0.016	− 3.16	.002	− 0.084	− 0.019
M. RPB (yesterday)	− 0.068	0.016	− 4.13	<.001	− 0.101	− 0.035
W. Satisfaction	0.214	0.023	9.36	<.001	0.169	0.260
M. Satisfaction	0.218	0.025	8.80	<.001	0.169	0.267
Mean W. Mate value	0.839	0.075	11.22	<.001	0.691	0.988
Mean M. Mate value	0.831	0.066	12.64	<.001	0.701	0.961
<i>Dependent variable model (DV=Relationship-promoting behaviors)</i>						
W. Intercept	4.078	0.054	76.18	<.001	3.972	4.184
M. Intercept	4.354	0.045	96.18	<.001	4.264	4.444
W. Desire	0.123	0.020	6.21	<.001	0.082	0.163
M. Desire	0.124	0.019	6.36	<.001	0.084	0.163
W. Mate value	0.092	0.027	3.42	.001	0.039	0.144
M. Mate value	0.058	0.032	1.81	.077	− 0.006	0.123
W. Time	0.001	0.001	0.77	.442	− 0.001	0.002
M. Time	0.000	0.001	0.61	.540	− 0.001	0.002
W. RPB (yesterday)	− 0.070	0.018	− 3.88	<.001	− 0.106	− 0.034
M. RPB (yesterday)	− 0.036	0.015	− 2.38	.021	− 0.067	− 0.006
W. Satisfaction	0.467	0.030	15.55	<.001	0.407	0.527
M. Satisfaction	0.546	0.026	20.62	<.001	0.493	0.599
Mean W. Desire	0.277	0.099	2.78	.007	0.079	0.474
Mean M. Desire	0.011	0.089	0.13	.900	− 0.167	0.189
Mean W. Mate value	0.175	0.119	1.47	.145	− 0.061	0.410
Mean M. Mate value	0.356	0.102	3.49	.001	0.153	0.559

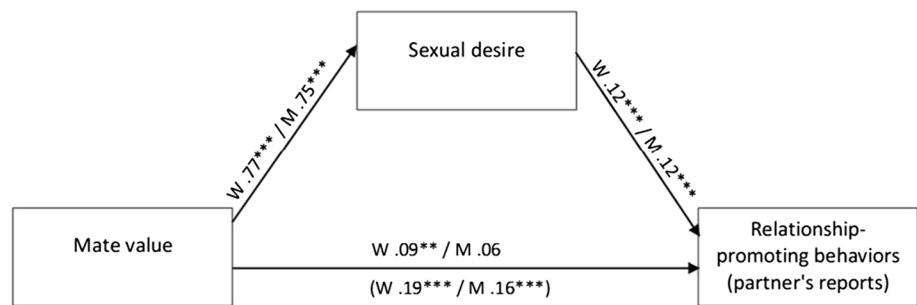
RPB = Relationship-promoting behaviors; W = women, M = men; all daily items were rated on a 5-point scale; *n* = 100 couples

Variables that are the main focus of this analysis are presented in bold

motivating investment in the relationship with such a valued and thus desired partner.

Reduced sexual desire, in contrast, may deny the relationship these benefits. Prior research has already indicated that

Fig. 3 Mediation model showing that sexual desire mediated the association between mate value and relationship-promoting behaviors in Study 3. Note. W = women, M = men. Path coefficients are unstandardized; values in parentheses are total effects. * $p < .05$, ** $p < .01$, *** $p < .001$



people tend to view sexual activity as an indicator of relationship quality (e.g., Elliott & Umberson, 2008; Kingsberg, 2002), such that people who are dissatisfied with their relationship and have doubts about compatibility may experience a lack of sexual desire for their partner (Buss et al., 2017; Gangestad et al., 2005; Mark & Lasslo, 2018). Our findings add to this research, showing, first, that experiencing low sexual desire for one's partner may stem from perceiving this partner to be less valuable as a mate, and second, may be translated into less investment in the relationship, which eventually might hurt the relationship and foretell its demise. We expand on these ideas in the general discussion.

Study 4

In Study 4, we used a longitudinal design to explore whether the proposed mediating model would extend to other relationship-promoting behaviors that signal caring about a partner's well-being (i.e., sacrificing for one's partner; Kogan et al., 2010). The variable of interest here was sacrifice for one's partner, which has been shown in prior research to be an important relationship-maintenance mechanism (Etcheverry & Le, 2005; Van Lange et al., 1997). This outcome measure was slightly more specific than that assessed in Study 3 and therefore has the additional benefit of lessening the likelihood that any findings would be due to response consistency. Specifically, using a sample of 75 dating couples assessed at monthly intervals over 6 months, we examined perceptions of partner mate value, feelings of passion for one's partner, and engagement in the relationship-promoting behavior of sacrificing for one's partner. We hypothesized that increases in perceptions of partner mate value from 1 month to the next would predict increases in sacrifice over the same period. We also hypothesized that this association would be mediated by increases in feelings of passion.

Method

Participants

We recruited both members of 75 heterosexual dating couples ($N = 150$ individuals) through posters and advertisements on a university campus in the Midwest region of the USA. Participants were an average of 20.46 years old ($SD = 1.71$) and had been involved in their dating relationships for an average of 16.80 months ($SD = 13.73$). The majority (67%) of participants were Caucasian (24% Asian, 5% Hispanic, 2% African American, and 2% other). Each participant received \$80 for completing all study components across the duration of the 6-month longitudinal study, or a prorated amount if they completed only some of the study components.

During the course of the study, 14 couples' relationships ended. These couples did not differ in terms of age, racial background, or relationship duration from the couples whose relationships remained intact, all $ps > 0.20$. For the purposes of the current study, the individuals in these couples were included in the analyses reported below only while their relationships were ongoing. Starting at the follow-up survey at which the couple reported the dissolution, their data were no longer included in analyses.

Procedure

At study onset, participants completed an online intake survey and participated in a laboratory session that involved various elements not relevant to the present report.³ Participants completed monthly online follow-up surveys for the next 6 months, yielding seven waves of data collection over 6 months. All of the measures used in this paper were assessed in the survey components. The data collection ran from February 2009 to December 2009.

³ Participants were part of a larger project (see DeWall et al., 2011; Richman et al., 2016; Righetti et al., 2015; Slotter et al., 2014; Slotter & Luchies, 2014).

Table 5 Study 4 Sacrifice Scale Items

Item	Subscale
I often put aside my own interests for the sake of my relationship with my partner	Actual sacrifice
I would be willing to give up desirable activities for the sake of my relationship	Willingness to sacrifice
When my interests conflict with my partner's interests, I usually get my way (reverse-scored)	Actual sacrifice
I would hesitate to engage in undesirable activities to maintain my relationship (reverse-scored)	Willingness to sacrifice
I regularly make sacrifices for my partner	Actual sacrifice
I would happily engage in unpleasant activities for the sake of my relationship	Willingness to sacrifice
I rarely give things up for my partner and relationship (reverse-scored)	Actual sacrifice
I would be reluctant to make sacrifices to maintain my relationship (reverse-scored)	Willingness to sacrifice

Measures

At each monthly report, participants reported their perceptions of their partners mate value, feelings of passion for their partner, and the relationship-promoting behavior of sacrifice for their partner. We note that it is more appropriate to use own reports of sacrifice, unlike the partner reports of relationship-promoting behavior used in Study 3, inasmuch as sacrifices are often invisible to partners.

Mate Value

Perceptions of partners' mate value were assessed using a 12-item mate value scale. Participants used a 7-point scale to rate the extent to which their partner possesses each of 14 positive traits (1 = *not at all*, 7 = *extremely*). The 12 traits were good career prospects, ambitious/driven, fun/exciting, funny, responsive, dependable/trustworthy, friendly/nice, charismatic, confident, assertive, smart, and intellectually sharp. Partner mate value was assessed in each of the six online follow-up surveys, but was not assessed at study intake. Higher values indicate higher ratings of partner mate value, and the scale exhibited good reliability across the follow-up surveys ($\alpha = 0.91$, $M = 5.96$, $SD = 0.66$).

This 12-item scale was modified from an existing mate value assessment which contained 14 positive traits (Tidwell et al., 2013). In addition to the 12 traits used in the current study, the original scale also contained the items "physically attractive" and "sexy/hot." These items were omitted due to concerns regarding overlap with our assessments of sexual desire. In the present research, the modified 12-item measure was modestly yet significantly correlated with sexual desire across the course of the study, $r = .44$, $p < .001$.

Sexual Desire

Participants reported the level of sexual desire felt for their partner using the three passion items from the Perceived Relationship Quality Components Inventory (PRQC, e.g., "How passionate do you feel toward your partner?"; Fletcher et al.,

2000). Each item was rated on a 7-point scale (1 = *not at all*, 7 = *extremely*). Although feelings of passion for one's partner are slightly different than feelings of sexual desire for one's partner, past research has indicated that desire and passion are highly correlated (de Jong et al., 2019) and thus scholars often use these terms interchangeably (e.g., Gonzaga et al., 2006). Sexual desire was assessed in the online intake survey and in each of the six online follow-up surveys; however, only data from the follow-up surveys were used in the present study because partner mate value was not assessed in the online intake survey. Higher values indicate higher levels of passion, and the scale exhibited good reliability across the follow-up surveys ($\alpha = 0.91$, $M = 5.77$, $SD = 1.14$).

Relationship Promotion

Participants reported their level of sacrifice for their partner as a measure of relationship-promoting behavior. Sacrifice was assessed using a scale developed for this study, and participants rated each item using a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). Sacrifice was assessed in the online intake survey and in each of the six online follow-up surveys; however, only data from the follow-up surveys were used in the current study. This scale included a four-item subscale assessing willingness to sacrifice ($\alpha_{\text{across follow-ups}} = 0.76$, $M = 4.75$, $SD = 1.11$) and a four-item subscale assessing actual sacrificing behavior ($\alpha_{\text{across follow-ups}} = 0.68$, $M = 4.47$, $SD = 0.99$). All items are listed in Table 5.⁴ We standardized ($M = 0$, $SD = 1$) both the willingness to sacrifice subscale and the actual sacrifice subscale, and the average of these subscales was significantly correlated across the follow-up surveys, $r = .34$, $p < .001$. As willingness to perform a behavior and actually performing said behavior represent slightly different outcomes, we present our results separately for

⁴ If the two subscales are ignored, all eight items exhibited acceptable reliability as a unitary construct ($\alpha = .75$). If we create the composite sacrifice score using all items prior to standardizing them and then standardize the composite measure, our reported results are not meaningfully different.

each subscale within each relevant table. For both subscales, higher values indicate higher levels of either willingness to or actual sacrifice, respectively.

Results and Brief Discussion

Analytic Strategy

All analyses employed a multi-level modeling similar to that used in Study 3, to account for the non-independence in the dataset, as the data were nested both within individual over time (monthly follow-ups) and within couple (Kenny et al., 2006). All variables were standardized prior to analyses ($M=0$, $SD=1$) to simplify interpretation of effect sizes. The results reported were not moderated by participant gender or relationship length.

We next tested our hypotheses that:

1. Monthly changes in perceptions of partner's mate value would predict monthly changes in relationship-promoting behaviors, such that increases in mate value perceptions would predict increases in relationship-promoting behavior (Model 1).
2. Monthly changes in perceptions of partner's mate value would predict monthly changes in sexual desire for the partner, such that increases in mate value perceptions would predict increases in sexual desire (Model 2).
3. Monthly changes in sexual desire would significantly mediate the association between monthly changes in mate value perceptions and monthly changes in relationship-promoting behaviors (Model 3).

Because all three models examined month-to-month fluctuations in the variables of interest, we adopted a regressed change approach, again similar to the approach used in the previous study (Cohen et al., 2003). Thus, in each multi-level model, we predicted the current month's outcome variable from the current month's predictor variable, while treating the lagged, previous month's predictor and outcome variables as covariates. This approach removes correlations between current and previous month ratings on all included variables (Cohen et al., 2003). The remaining association between predictor and outcome variables in that same month thus represents changes in outcome variables from month to month as a function of changes in the predictor variable.

The specific models were, for each individual, i , at each follow-up month, m , or previous follow-up month, $m - 1$:

Model 1: *Relationship-Promoting Behavior* _{im} = π_{0i} + π_{1i} (*Mate Value Perceptions* _{im}) + π_{2i} (*Mate Value Perceptions* _{$m-1$}) + π_{3i} (*Relationship-Promoting Behavior* _{$im-1$}) + ϵ_{im} .

Model 2: *Sexual Desire* _{im} = π_{0i} + π_{1i} (*Mate Value Perceptions* _{im}) + π_{2i} (*Mate Value Perceptions* _{$m-1$}) + π_{3i} (*Sexual Desire* _{$im-1$}) + π_{4i} .

Model 3: *Relationship-Promoting Behavior* _{im} = π_{0i} + π_{1i} (*Mate Value Perceptions* _{im}) + π_{2i} (*Mate Value Perceptions* _{$m-1$}) + π_{3i} (*Relationship-Promoting Behavior* _{$im-1$}) + π_{4i} (*Sexual Desire* _{im}) + π_{5i} (*Sexual Desire* _{$im-1$}) + ϵ_{im} .

As previously noted, we ran Models 1 and 3 twice: once predicting willingness to sacrifice as our relationship-promoting behavior of interest, and once predicting actual sacrifice as our relationship-promoting behavior of interest. Model 2 did not include relationship-promoting behaviors, so was run only once. An alternative series of analyses was also run, conceptualizing changes in sexual desire as the predictor of changes in relationship promotion behaviors, and changes in perceptions of mate value as the mediating variable. In this alternative model, the mediator failed to reduce the association between the predictor and outcome.

In order to examine the proposed mediational pathway, we employed the MLMED macro for Model 3 (Rockwood & Hayes, 2017), which is appropriate for testing nested mediational models (e.g., Ledermann et al., 2011). This approach allowed us to test whether monthly sexual desire fluctuations accounted for the relationship between monthly mate value perception variability and monthly fluctuations in relationship-promoting behaviors within our nested dataset. The MLMED macro uses a maximum likelihood approach, with Monte Carlo 95% confidence intervals, and the current analysis was based on 5000 resamples.

Preliminary Analyses

We first explored how each of our key factors varied across the 6-month follow-up period. Mate value ratings increased across the 6 months, $\beta=0.10$, $t(71.4)=6.52$, $p<.001$, 95% CI [0.07, 0.12]; sexual desire decreased across the 6 months, $\beta=-0.05$, $t(74)=-2.46$, $p=0.02$, 95% CI [-0.09, -0.01], and relationship-promoting behaviors did not vary significantly across the 6 months, $t=0.41$, $t(141)=0.41$, $p=0.68$, 95% CI [-0.02, 0.02].

Model 1

Model 1 examined whether monthly changes in perceptions of mate value were associated with monthly changes in relationship-promoting behaviors. Results are presented in Table 6. Participants' current month perceptions of their partner's mate value were positively associated with their current month relationship-promoting behaviors of willingness to sacrifice, but not actual sacrifice. Given that this lagged model controlled for the participants' mate value perceptions and relationship-promoting behaviors in the previous month,

Table 6 Study 4 Model 1 results: Predicting monthly changes in relationship-promoting behavior

Relationship-promoting behavior subscale	Parameter	β	SE	<i>t</i>	<i>P</i>	<i>df</i>	95% CI
Willingness to Sacrifice	Intercept	0.00	0.07	0.03	.97	58.2	[– .14, .15]
	Current Month Mate Value	0.22	0.04	5.56	<.001	710	[.15, .30]
	Previous Month Mate Value	– 0.02	0.03	– 0.60	.55	701	[– .08, .05]
	Previous Month Relationship-Promoting Behavior	0.01	0.03	0.26	.79	726	[– .05, .08]
Actual Sacrifice	Intercept	0.06	0.07	0.80	.43	99.2	[– .09, .21]
	Current Month Mate Value	– 0.05	0.04	– 1.21	.22	738	[– .14, .03]
	Previous Month Mate Value	0.02	0.04	0.43	.67	689	[– .06, .09]
	Previous Month Relationship-Promoting Behavior	– 0.04	0.03	– 1.36	.17	724	[– .11, .01]

Table 7 Study 4 Model 2 results: Predicting monthly changes in sexual desire for one's partner

Parameter	β	SE	<i>t</i>	<i>p</i>	<i>df</i>	95% CI
Intercept	– 0.01	0.05	– 0.14	.89	1391	[– .11, .09]
Current Month Mate Value	0.44	0.03	12.87	<.001	744	[.37, .51]
Previous Month Mate Value	0.02	0.03	0.69	.49	727	[– .04, .08]
Previous Month Sexual Desire	0.03	0.03	1.07	.28	720	[– .02, .09]

Table 8 Study 4 Model 3 results: Association between monthly changes in mate value perceptions and monthly changes in relationship-promoting behaviors as mediated by monthly changes in sexual desire

Relationship-promoting behavior subscale	Parameter	β	SE	<i>t</i>	<i>p</i>	<i>df</i>	95% CI
Willingness to Sacrifice	Intercept	0.01	0.07	0.08	0.93	57.2	[– .13, .14]
	Current Month Mate Value	0.16	0.04	3.62	0.003	681	[.07, .25]
	Current Month Sexual Desire	0.15	0.04	3.53	0.004	727	[.06, .25]
	Previous Month Mate Value	– 0.02	0.04	– 0.60	0.55	688	[– .09, .05]
	Previous Month Sexual Desire	– 0.01	0.04	– 0.27	0.79	698	[– .08, .06]
	Previous Month Relationship-Promoting Behavior	0.02	0.03	0.52	0.60	723	[– .04, .08]
Actual Sacrifice	Intercept	0.06	0.07	0.86	0.39	103	[– .08, .21]
	Current Month Mate Value	– 0.07	0.05	– 1.53	0.13	730	[– .17, .02]
	Current Month Sexual Desire	0.06	0.05	1.25	0.21	736	[– .04, .15]
	Previous Month Mate Value	0.04	0.04	0.95	0.34	699	[– .04, .11]
	Previous Month Sexual Desire	– 0.08	0.04	– 1.90	0.07	716	[– .16, – .01]
	Previous Month Relationship-Promoting Behavior	– 0.04	0.03	– 1.23	0.22	725	[– .10, .02]

this regressed change approach indicates that increases in participants' mate value perceptions from month to month predicted increases in their relationship-promoting behaviors in willingness to sacrifice from month to month. Neither previous month mate value nor relationship-promoting behavior significantly predicted current relationship-promoting behavior.

Model 2

Model 2 examined whether monthly changes in perceptions of mate value were associated with monthly changes in

sexual desire for the partner. Results are presented in Table 7. Participants' current month perceptions of their partner's mate value were positively associated with their current month sexual desire for their partner. Given that this model controlled for the participants' mate value perceptions and sexual desire in the previous month, this regressed change approach indicates that increases in participants' mate value perceptions from month to month predicted increases in their sexual desire for their partner from month to month. Neither previous month mate value nor sexual desire significantly predicted current sexual desire.

Model 3

Model 3 examined whether monthly changes in sexual desire for the partner would mediate the association between monthly changes in perceptions of mate value and monthly changes in relationship-promoting behaviors. Results are presented in Table 8. When sexual desire, the hypothesized mediator, was included in the model, current month mate value remained a significant predictor of the current month relationship-promoting behavior of willingness to sacrifice, but not actual sacrifice. Additionally, current month sexual desire significantly predicted the current month relationship promotion behavior of willingness to sacrifice, but not actual sacrifice. Given that this model controlled for the participants' mate value perceptions, sexual desire, and relationship-promoting behavior in the previous month, this regressed change approach indicates that increases in sexual desire from month to month predicted increases in relationship-promoting behaviors in willingness to sacrifice from month to month. Neither previous month mate value, relationship-promoting behavior, or sexual desire significantly predicted current relationship-promoting behavior.

We next examined whether monthly changes in sexual desire significantly mediated the association between monthly changes in mate value perceptions and monthly changes in the relationship-promoting behavior of willingness to sacrifice. Given the null effects for actual sacrifice, mediation tests were not appropriate and thus not conducted on this subscale. In the analysis for willingness to sacrifice, the 95% confidence interval for the indirect effect did not contain zero [0.011, 0.089], $\beta = 0.16$, $SE = 0.03$. This indicates that the direct effect of monthly changes in mate value perception on relationship-promoting behavior was significantly mediated by monthly changes in sexual desire. Thus, perceiving one's mate to be of higher value fostered greater sexual desire for the partner, which, in turn, increased the willingness to engage in relationship-promoting behaviors, such as sacrificing for one's partner.

These results add support for the theoretical model developed in the pilot study and in Studies 1–3 by establishing its validity over a longer time frame and for a distinct relationship-promoting behavior, willingness to sacrifice. Specifically, Study 4 showed that over a 6-month span, monthly changes in perceptions of partner's mate value predicted corresponding monthly changes in the desire for sex with this partner. These monthly changes in sexual desire, in turn, predicted corresponding changes in willingness to sacrifice for the partner. Perceiving one's mate to be of higher value initiates a cascade of mate-retaining processes that promote the relationship with this valued, and thus sexually desired, partner.

The present study suggests that people feel a willingness to use these mate-retaining strategies, presumably in the hope

that they will minimize the possibility that a desirable partner would be allured by alternative partners. We did not find similar result for enacted sacrifice, possibly because some of these strategies may be too costly for oneself (Van Lange et al., 1997) or because other considerations may have interfered (e.g., work or family commitments). Although willingness to sacrifice does not always lead to actual sacrifice, several studies have shown that the willingness to sacrifice is an important marker of prosocial orientation toward one's partner, and in particular the desire to keep them invested in the relationship and disinterested in considering alternatives (Reis et al., 2010; Van Lange et al., 1997). Further research on the discrepancy between willingness to sacrifice and enacted sacrifice would be beneficial.

Another limitation of the present research is unclarity about whether the measures reflect a single day in time instead of a month. Relationship quality and mate perceptions measures can vary across all sorts of time metrics (e.g., daily, monthly; Birnbaum et al., 2006; Troxel et al., 2007). And yet, although daily shifts would accrue to produce monthly overall shifts, people's recent experiences are likely to weigh more heavily in their minds than events that happened nearly a month ago, especially if, as in the present study, the measures were not prefaced by instructions to think about the past month.

General Discussion

The literature has posited sexual desire as a prime motivator in romantic bonds, one that attracts intimates and binds them together throughout relationship development (Birnbaum, 2018; Birnbaum & Finkel, 2015; Birnbaum & Reis, 2019). Past research has corroborated this view, illustrating the relationship-supporting role of sexual desire and indicating that a passionate sex life predicts relationship well-being (e.g., Birnbaum et al., 2006; Debrot et al., 2017; Rubin & Campbell, 2012). The present study extends this research, being the first to establish a causal connection between experiencing sexual desire and engaging in non-sexual relationship-promoting behaviors. It is also the first to point that perception of partner mate value drives this process.

In five studies, we show that experiencing sexual desire for one's partner increases the likelihood of engaging in behaviors that help maintain a satisfying intimate relationship over time and that perception of partner mate value helps explain why desire motivates enacting such behaviors. A pilot study experimentally manipulated sexual desire and found that experiencing sexual desire for one's partner instigated the desire to do something that would make this partner happy. Study 1 replicated and extended these findings, revealing that experiencing sexual desire for one's partner also translated into actual relationship-promoting behavior, as manifested

in heightened responsiveness to this partner's needs during face-to-face interaction. In addition, Study 1 demonstrated that the beneficial effects of shared positive experiences were exclusive to the sexual realm rather than to shared non-sexual experiences. Using experimental, daily experience diaries, and longer-term longitudinal methods, Studies 2–4 extended these findings, indicating that perceived partner mate value predicted desire for this partner, which, in turn, was associated with engagement in relationship-promoting behaviors and heightened relationship well-being.

Previous research has demonstrated that foreplay may start outside the bedroom, such that engaging in exciting and self-expanding non-sexual activities with one's partner (e.g., learning new things together, participating in arousing shared activities) increases the desire to have sex with this partner (e.g., Muise et al., 2019). The present studies add to this existing body of research by indicating that the link between sexual desire and relationship dynamics is bi-directional. Experiences of sexual desire are likely to migrate beyond the bedroom and be manifested in non-sexual relationship-promoting behaviors (e.g., expressing affection to one's partner, being considerate of a partner's feelings, sacrificing for the partner) as much as non-sexual behaviors can affect the atmosphere inside the bedroom. In this way, sexual desire can fulfill the relationship-promoting role that has long been assumed (Birnbaum, 2014; Hazan & Zeifman, 1994).

Our findings indicate that this process is initiated, at least in part, by the perception of a partner's mate value. Higher (vs. lower) sexual desire follows from greater partner mate value and thus induces heightened exertions toward the deepening of romantic relationships with this desirable and valued partner (Birnbaum, 2018; Birnbaum & Finkel, 2015). Clearly, such dynamics may vary over the course of relationships, as the future may carry with it unwanted changes in key components of partners' mate value (Buss et al., 2017). In the early stages of relationship development, people often disguise their flaws (Birnbaum et al., 2020; Haselton et al., 2005; Swann et al., 1994), later gradually becoming inattentive to each other's needs, for example; social status, health, physical attractiveness, and well-being may also ebb (and rise) with time (Buss et al., 2017). The present research suggests that declines in sexual desire, which are typically reported by long-term couples (Birnbaum et al., 2007; McNulty et al., 2016), may be driven, at least in part, by corresponding changes in perceptions of partner mate value and may eventually deter future investment in the current relationship (Birnbaum, 2018; Buss et al., 2017). Such decreases are likely to be a prime factor in the well-documented decreases in relationship satisfaction that occur over time in marriage and other marital-like relationships (e.g., Kurdek, 1998; Lavner & Bradbury, 2010).

One important contribution of this research is providing the first empirical evidence of which we are aware, supporting

a theoretical model linking mate value, sexual desire, and pro-relationship behavior. Theoretically, our studies establish sexual desire as an important motivator of relationship-promoting behaviors, providing clues that help us understand the findings of prior studies showing that sexual desire is associated with happier relationships (e.g., Birnbaum et al., 2007; Muise et al., 2013). We note that those prior studies tend to be correlational; our experiments support the interpretation that sexual desire has a causal influence on relationship well-being (although, of course, the reverse might also be true).

Of course, sexual desire is only one of the forces that may affect partner's enactment of behaviors that promote relationship maintenance. Many psychological processes influence relationship quality and stability (e.g., interdependence, commitment, trust; Berscheid & Regan, 2005; Finkel et al., 2017) and may contribute to decreases and increases in the level of sexual desire (Birnbaum, 2018). In other words, sexual desire is not the only factor that influences relationship-promoting behavior. From a practical standpoint, if non-sexual benefits of a relationship cannot compensate for the lack of sexual desire, a decline in sexual desire may render the relationship more vulnerable and even lead to its termination or to extradyadic involvement with potentially more compatible partners (Birnbaum, 2018; Birnbaum et al., 2019a; b; Buss et al., 2017). Future research is needed to establish the influence of decreases in sexual desire relative to other psychological processes as determinants of diminished enactment of relationship-promoting behavior.

Limitations, Future Directions, and Conclusions

The present results should be interpreted in light of certain caveats. For one, these data did not allow us to test the possibility that sexual desire is particularly likely to affect relationship well-being, for better or worse, in vulnerable couples, such as those with partners who are likely to be tempted (e.g., people with an unrestricted sociosexual orientation; Penke & Asendorpf, 2008) or those with partners who have characteristics that predispose them to difficulties (e.g., attachment insecurity, rejection sensitivity; Birnbaum et al., 2006; Downey et al., 1997). For these couples, the reassurance conveyed by sexual desire may compensate for other relationship deficiencies, whereas a lack of sexual desire may be viewed as a sign of rejection or disappointment and become the last straw in an already strained relationship. Future research should explore whether the relational consequences of varying levels of sexual desire depend on relevant individual differences.

Relatedly, our samples were composed of young, sexually active individuals in relatively high-functioning relationships of moderately short duration and thus preclude conclusions about the influence of desire on relationship outcomes in longer-term relationships. Some of the key transitions that

are typical of very long-term relationships (e.g., aging of the reproductive systems, children leaving home) are known to affect sexual and relationship functioning (e.g., Birnbaum et al., 2007; Call et al., 1995). Beyond such inevitable changes, the experience of sexual desire is especially important as a relationship-promoter in earlier stages of relationship development, when desire is a prime motivator of relationship pursuit. In later stages, when attachment between partners has become well consolidated, sexual desire may lose some of its value as a binding force as other non-sexual processes take over and sustain the relationship (Birnbaum, 2018).

Follow-up studies should investigate whether the relationship-promoting effects of desire change as relationships progress and how desire affects relationship quality and longevity in more heterogeneous samples. It will also be valuable to investigate how this process operates in couples where one or both partners experience sexual problems, such as erectile dysfunction or hypoactive sexual desire. Future research may explore, for example, whether an improvement in sexual desire following targeted treatments produces corresponding changes in relationship-promoting behavior. Another question that requires future attention is why sexual desire encourages engagement in relationship-maintenance behaviors. For example, it is possible that sexual desire promotes sexual activity, which is pleasurable, thus reinforcing investment in the relationship. Further research is needed to explore whether reinforcing pleasure, feelings of connectedness to one's partner, or the desire to keep the partner around motivate this process.

Notwithstanding these limitations, our research demonstrates the functional significance of sexual desire within the context of existing relationships, indicating that desire serves as a mechanism that encourages investment in partners that are worth pursuing. Past studies have revealed that sexual desire for a prospective partner serves as a gatekeeper in relationship initiation processes (Birnbaum & Reis, 2012; Birnbaum et al., 2018). The present research indicates that sexual desire keeps affecting relationship quality and stability later on, regulating levels of investment in ongoing relationships and ensuring that only relationships with valued partners will be sustained. By doing so, the findings highlight the dual function of sexual desire for both relationship promotion and deterioration (Birnbaum, 2018; Birnbaum & Reis, 2019), showing that desire (or lack of) may either foster a relationship with a valued partner or reduce investment in a relationship with a partner who no longer seems suitable. Overall, our research encourages a more comprehensive approach to couple interventions that focuses not only on reduction of negative relationship processes that erode the perception of one's partner mate value, but also on enhancement of sexual desire, one of several appetitive sex-related processes. By helping couples regain earlier levels of sexual desire,

interventions can contribute to maintaining and enhancing the relationship over the long term.

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Declarations

Conflict of interest The authors declare that they have no conflicts of interest with respect to their authorship or the publication of this article.

Ethical Approval All study procedures were approved by the Ethics Committee of the Faculty of Psychology, Interdisciplinary Center Herzliya, prior to data collection.

Informed Consent Informed consent was obtained from all individual participants included in this study.

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