

Intimately Connected: The Importance of Partner Responsiveness for Experiencing Sexual Desire

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Sexual desire tends to subside gradually over time, with many couples failing to maintain desire in their long-term relationships. Three studies employed complementary methodologies to examine whether partner responsiveness, an intimacy-building behavior, could instill desire for one's partner. In Study 1, participants were led to believe that they would interact online with their partner. In reality, they interacted with either a responsive or an unresponsive confederate. In Study 2, participants interacted face-to-face with their partner, and judges coded their displays of responsiveness and sexual desire. Study 3 used a daily experiences methodology to examine the mechanisms underlying the responsiveness–desire linkage. Overall, responsiveness was associated with increased desire, but more strongly in women. Feeling special and perceived partner mate value explained the responsiveness–desire link, suggesting that responsive partners were seen as making one feel valued as well as better potential mates for anyone and thus as more sexually desirable.

Keywords: gender differences, mate value, responsiveness, romantic relationships, sexual desire

Sexual desire is among the strongest forces in human nature—one that may induce overwhelming pleasures and intensely meaningful experiences or profound yearning and disappointment. As such, it plays a major role not only in attracting potential partners to each other but also in promoting an enduring bond between them. Indeed, the absence of sexual desire, which is prevalent in both subclinical samples and clinical practice (e.g., Laumann,

Gagnon, Michael, & Michaels, 1994; Rosen, 2000), has long been considered as an important index of disrupted relational harmony (Kaplan, 1979; Leiblum & Rosen, 1988), depriving relationships of intimacy (McCarthy, Bodnar, & Handal, 2004) and often leading to breakup and divorce (e.g., Regan, 2000). It is therefore of little surprise that both clinicians and researchers have searched for effective strategies to prevent against the waning of sexual desire in long-term relationships (e.g., McCarthy & Farr, 2012; Muise, Impett, Kogan, & Desmarais, 2013).

Because sex is a prominent pathway through which people seek a sense of felt understanding and caring (Birnbaum & Reis, 2006), it is easy to understand why scholars have acknowledged the contribution of intimacy-related processes to sexual desire. However, the relevant literature has been largely based on clinical impressions rather than systematic research (see review by Ferreira, Narciso, & Novo, 2012). Furthermore, findings from the few studies that have focused on the intimacy–desire linkage (e.g., Birnbaum, Cohen, & Wertheimer, 2007; McCabe, 1997; Patton & Waring, 1985) are hard to interpret because of several methodological issues, such as the use of correlational designs, which preclude causal conclusions about the link between intimacy and the desire for sex, and the possibility of motivated distortion in participants' reports of sensitive topics like sexual desire (de Jong & Reis, 2015). To be sure, no prior research examining the intimacy–desire link has used an experimental manipulation of intimacy displays or has assessed behavioral expressions of sexual desire, which would rule out a motivated construal process expla-

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nation (Reis & Gable, 2000). Another issue that has ambiguated interpretation of prior studies is vagueness concerning the conceptual and operational definitions of intimacy (Reis, Clark, & Holmes, 2004).

To address these concerns, we relied on complementary methods and a clear, behaviorally focused definition. Moreover, because intimacy may be manifested in numerous ways, some of which may be relatively uninfluential, we suggest that couple interactions may best profit from a heightened sense of responsiveness. This key intimacy-building behavior (Reis & Clark, 2013) may be more likely than less personal manifestations of intimacy (e.g., familiarity, comfort with each other's company) to engender a sense that the partner is valuable and that the relationship is special, both of which seem conducive to increasing desire. In line with this reasoning, in the present set of studies, we aimed to investigate the contribution of partner responsiveness to the desire to have sex with that partner. Our research extends previous research in several ways. First, we sought to establish a causal connection between expressions of responsiveness and sexual desire in ongoing relationships. Second, in an attempt to delineate the mechanisms underlying this connection, we focused on whether the sense of uniqueness and perceptions of a partner's mate value that partner responsiveness might evoke explain its expected effect on sexual desire. Third, given that women's sexual responses are more attuned to the relational context than those of men (e.g., Baumeister, 2000; Birnbaum & Laser-Brandt, 2002), we also examined whether men and women diverge in their sexual reactions to a responsive partner, and we addressed the role of uniqueness and perceived partner mate value as potential mechanisms for understanding these gender differences.

The Contribution of Expressions of Intimacy to Sexual Desire

Perceived partner responsiveness is inherent to the development of intimacy in sexual contexts, in which people seek understanding, validation, and caring (Birnbaum & Reis, 2006). People who perceive that their partners understand and appreciate their needs can view sexual interactions as one way to enhance intimate experiences with responsive partners and, accordingly, may experience greater desire for sex with them. In contrast, people who perceive that their partners are unresponsive to their needs may avoid sexual activity with them, thereby forgoing the potential intimacy provided by sex. This reasoning aligns with the contention that passion is fueled by cues of rising intimacy (e.g., displays of affection and understanding; Baumeister & Bratslavsky, 1999), and is corroborated by cross-sectional studies showing that in established relationships, intimacy relates positively to sexual desire (e.g., Birnbaum et al., 2007; Štulhofer, Ferreira, & Landripet, 2014). It is also supported by a diary study indicating that daily increases in intimacy reported by both partners predicted higher relationship passion and a higher probability of engaging in sex (Rubin & Campbell, 2012).

Challenging this view, recent studies have revealed that during the earliest phase of acquaintanceship, a responsive potential partner, who seems to want to be close, is less likely than a relatively nonresponsive partner to arouse sexual interest in some people (Birnbaum, Ein-Dor, Reis, & Segal, 2014; Birnbaum & Reis, 2012). Still, it is not known whether findings about responsiveness

and sexual desire based on the early stages of romantic relationships apply to established relationships, given that the contextual meaning of partner responsiveness likely changes across different stages of relationship development. In initial encounters, which tend to be suffused with uncertainty (Afifi & Lucas, 2008), some people may be cautious when interpreting a stranger's expressions of responsiveness. For example, they may attribute responsiveness to ulterior motives (e.g., as a manipulation to obtain sexual favors, a self-presentation strategy) or to neediness, and thus perceive a responsive potential partner as less sexually desirable than an unresponsive partner (Birnbaum et al., 2014; Birnbaum & Reis, 2012).

However, as relationships develop, responsiveness may acquire a different meaning and signal to partners that one genuinely understands, values, and supports important aspects of their self-concept and is willing to invest resources in the relationship (Birnbaum & Reis, 2012; Reis & Clark, 2013), and therefore may become more uniformly desired in a partner (Clark & Lemay, 2010). Indeed, unlike less intimate expressions that signal one's general intention to "act nice," which may be more typical of initial encounters, a partner's provision of responsiveness in ongoing relationships not only signifies general communal tendencies but also indicates the partner's specific awareness of who one is at a relatively deep level, and what one truly wants. That is, in social relations model terminology (Kenny, 1990), responsiveness in an established relationship may signify relationship-specific caring and concern, above and beyond dispositional tendencies to be responsive ("You don't just care about people, you care about me in particular"). Recognizing this specific awareness in a partner makes the relationship feel special (Birnbaum & Reis, 2012; Kenny, 1990; Reis & Clark, 2013), which is, at least in Western life, what people seek from their romantic relationships (Eastwick, Finkel, Mochon, & Ariely, 2007). This recognition thereby increases the responsive partner's perceived mate value and thus desirability (Birnbaum et al., 2014; Clark & Lemay, 2010).

In line with this theorizing, extensive evidence indicates that in established relationships, perceived partner responsiveness is associated with relationship well-being (see Reis & Clark, 2013, for a review). For example, among committed romantic couples, responsiveness during videotaped discussions of negative and positive events predicts changes in relationship well-being over 2 months (Gable, Gonzaga, & Strachman, 2006). In other studies, perceived partner responsiveness has been shown to foster trust and commitment in romantic relationships (Wieselquist, Rusbult, Foster, & Agnew, 1999; see Clark & Lemay, 2010, for a review). Theorists generally agree that perceived partner responsiveness benefits relationship well-being because it signifies the belief that a partner can be counted on to reliably support and promote important personal needs—one of the major functions of close relationships (Clark & Lemay, 2010; Reis & Clark, 2013).

The Present Research

This research demonstrates that responsiveness can have beneficial effects on many aspects of ongoing relationships. Nevertheless, that work virtually ignores sexuality in long-term partnerships. One study that has tackled the sexual arena is provided by Muise, Impett, Kogan, et al. (2013), who found that the motivation to meet a partner's sexual needs (i.e., sexual communal strength)

predicts heightened feelings of sexual desire in long-term relationships. Although sexual communal strength is conceptually relevant to responsiveness, it is focused specifically on sexual responsiveness rather than general responsiveness. Even though these two constructs are somewhat correlated (Birnbaum & Reis, 2006), they are not isomorphic; a partner who understands one's needs in the bedroom may not be willing to meet one's needs outside of it, and, vice versa, a partner who is responsive in ordinary social interaction may not be sexually responsive. Such divergences may cause frustration that adversely affects sexual interactions over time.

In the present research, we used complementary methods, including experimental and daily diary designs, to examine whether and why partner responsiveness outside the bedroom affects sexual desire in ongoing relationships. In doing so, we took into account that sexual reactions to a partner's responsiveness might vary, reflecting gender-specific differences in the meaning of provision of responsiveness. This possibility is consistent with the assertion that women, who typically have more to lose from a poor mating choice than men do (i.e., because of greater investment in each offspring; Buss & Schmitt, 1993; Trivers, 1972), have evolved relatively greater sensitivity to cues of partners' willingness to provide care and invest resources in the relationship than men (Buss, 1989; Kenrick, Sadalla, Groth, & Trost, 1990).

Women should therefore have a better appreciation of a current partner's cues of investment (i.e., expressions of responsiveness, which are inherently geared toward promoting a partner's welfare) than men, and they should value responsiveness somewhat more. To be sure, although both men and women who pursue long-term mating value "good partner" and "good parent" indicators (e.g., being loving, kind, and understanding; Li, Bailey, Kenrick, & Linsenmeier, 2002), women's perceptions of partner's attractiveness are more influenced than those of men by evidence of a partner's willingness to invest in the relationship (Bleske-Rechek, Remiker, Swanson, & Zeug, 2006; Brase, 2006). For example, both sexes are negatively affected by seeing a potential long-term partner ignore a baby in distress, but this effect is stronger in women (Bleske-Rechek et al., 2006).

Based on these findings, we hypothesized that a partner's responsiveness would have a differential effect on men's and women's relationship and partner perceptions, and consequently on their desire for sex with this partner. More specifically, because responsiveness signals that a partner has "special" (that is, over and above that of casual acquaintances) concern with one's welfare in a way that is informed about one's needs and wishes (Reis et al., 2004), it is expected to make both men and women feel valued and cared for and appreciate their responsive partner more as a mate. These perceptions, in turn, should lead them to desire their partner more. However, to the extent that women emphasize behaviors that signify caregiving and investment more than men do (Bleske-Rechek et al., 2006; Brase, 2006), provision of responsiveness should have a stronger effect on their relationship-specific perceptions and desires.

This article reports three studies examining the contribution of partner responsiveness to sexual desire directed toward this partner. In all studies, participants rated their partners' responsiveness during a recent interaction and their desire to have sex with them. In Study 1, participants were led to believe that they would interact online with their partner. In reality, they discussed a recent personally meaningful life event with a confederate who sent either

responsive or unresponsive standardized messages. In Study 2, participants discussed a personal event face-to-face with their partner, thereby allowing interactions to unfold in a natural, spontaneous way. Following this procedure, partners were invited to express physical intimacy (e.g., caressing, kissing) with each other. These interactions were videotaped and coded by independent judges for displays of responsiveness and desire. Study 3 investigated the processes by which partner responsiveness affects men's and women's desire to have sex with this partner. For this purpose, over a span of 42 consecutive days, we asked both members of romantic couples to complete daily measures of their partner's responsiveness and mate value, feelings of being special, and sexual desire. Our specific predictions were as follows:

1. Partner responsiveness would be associated with increased desire.
2. Feeling special and perceiving that one's partner has high mate value would explain the responsiveness–desire link, such that responsive partners would enhance participants' feeling valued and would be seen as better mates and as more sexually desirable.
3. Provision of responsiveness would have a stronger effect on women's self- and partner perceptions and desire than on men's perceptions and desire.

Study 1

Study 1 was designed to establish a causal link between partner responsiveness and the desire to engage in sex with this partner. To do so, we employed an experimental design in which participants were led to believe that they would interact online with their partner. In reality, they discussed with a confederate over Instant Messenger a recent personal negative or positive event. The confederate responded to this disclosure by sending either responsive or unresponsive standardized messages. Following this discussion, participants rated how understood, validated, and cared for they felt during the interaction (i.e., perceived partner responsiveness; Reis et al., 2004) and their desire to engage in sexual activity with their partner.

Asking participants to disclose either a positive or a negative event enabled us to explore the potential contribution of event type to the desire to have sex with one's partner. In doing so, we followed previous research indicating that responses to positive event discussions were more strongly associated with relationship well-being than were responses to negative event discussions, possibly because of the diminished sense of self-worth implied by the need for support (Gable et al., 2006; Rafaeli & Gleason, 2009). We hypothesized that a similar pattern would be observed in sexual desire, because of the potential dampening effect of responsiveness to negative event disclosures on sexual desire, such that responsiveness to positive events disclosures would be more likely to instigate desire than responsiveness to negative events disclosures.

In this study, as well as in Study 2, sample size was determined via a priori power analysis using G*Power software package (Faul, Erdfelder, Buchner, & Lang, 2009) to ensure 80% power to detect a medium effect size, f , of 0.25 at $p < .05$. All data were collected

before any analyses were conducted; all data exclusions, manipulations, and variables analyzed are reported.

Method

Participants. One hundred fifty-three heterosexual Israeli couples participated in this study in exchange for 150 NIS (about \$40 U.S.). 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 included in the sample if they were in a steady monogamous relationship of longer than 4 months. Women ranged in age from 20 to 42 years ($M = 25.22$, $SD = 3.80$), and in education from 12 to 20 years of schooling ($M = 13.99$, $SD = 1.89$). Men ranged in age from 20 to 43 years ($M = 26.53$, $SD = 4.04$), and in education from 11 to 20 years of schooling ($M = 13.82$, $SD = 1.84$). Fifty-one percent of the couples were cohabiting and 18% were married. Six percent had children. Relationship length ranged from 4 to 216 months ($M = 35.40$, $SD = 30.29$). No significant differences were found between the experimental conditions for any of the sociodemographic variables.

Measures and procedure. Couples who agreed to participate in a study of personality and intimate interactions were scheduled to attend a single half-hour laboratory session, which closely followed the procedure of Birnbaum and Reis (2012, Study 2). Prior to each session, couples were randomly assigned to one of eight groups in a 2 (responsiveness: partners were responsive or unresponsive) \times 2 (event type: negative or positive event disclosure) \times 2 (disclosing participant gender: a male or a female discloser) design. Upon arrival at the laboratory, partners were led to believe that they would be participating in an online chat with each other. A research assistant then asked one member of each couple (i.e., the discloser; half men and half women, randomly selected from each couple) to discuss with the other partner over Instant Messenger a recent personal event. After role assignment, the other partner (i.e., the responder) was led into another room, and the disclosing partner was given instructions, which were adapted from Gable et al. (2006) to reflect online interactions. Instructions for the negative event discussions were as follows:

We would like you to choose some current problem, concern, or stressor you are facing in your life. This may be something that happened before but continues to bother you, something going on now, or something you anticipate will happen in the future. Some examples could be a recent argument with a friend or a family member, a grade in class, work or financial problems, or personal illness. Please pick something that has been on your mind recently, no matter how big or small you may think it is. While you are interacting, please feel free to talk about anything related to the personal concern by dividing it into three messages. Some suggestions would be to discuss the circumstances surrounding the concern in your first message, how you feel and what you think about the concern in your second message, and any other details or issues that you think are important, such as the implications of this event for your life, in your third message. Your partner can reply to each of your messages with a single line.

Instructions for the positive event discussions were similar, except for the introduction, as follows:

We would like you to choose some recent positive event from your life. This positive event may be something that happened to you

recently or in the past that continues to make you happy, something going on now, or something you anticipate will happen in the future. Some examples could be receiving a good grade in a class, a work promotion, or a financial windfall.

The disclosing partners and confederates then discussed the personal event for up to 10 min. During these discussions, the other partner watched a nature documentary. We experimentally manipulated responsiveness to negative event disclosures by having confederates copy standardized responsive (e.g., "You must have gone through a very difficult time"; "I completely understand what you have been through") or unresponsive (e.g., "Doesn't sound so bad to me"; "Are you sure that's the worst thing you can think of?") messages. Responsiveness to positive event disclosures was manipulated similarly. Illustrative standardized responsive messages are "Wow, that's really great!" and "What a great opportunity!"; and illustrative standardized unresponsive messages are "I guess, if that's the best thing you can think of" and "Doesn't sound so good to me." Both sets of standardized responses were previously pilot tested to fit the experimental condition (Birnbaum & Reis, 2012; Reis et al., 2010).

After the discussion, responding partners completed four items of the Hebrew version of a measure of responsiveness, 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, Maniaci, Caprariello, Eastwick, & Finkel, 2011). This measure served as a manipulation check. 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*). This scale was translated into Hebrew by Birnbaum and Reis (2012), who also validated its structure on an Israeli sample. The scale was factorially unidimensional and internally consistent (Cronbach's $\alpha = .91$) in our sample. Higher scores indicated greater perceived responsiveness.

Disclosing partners were then asked to think about how they felt right then and to complete nine items assessing their desire to engage in various presexual and sexual activities (kissing, fooling around, and having sexual intercourse) with their partner (e.g., "To what extent would you be interested in having sex with your partner?"). These items were adapted from the sexual desire scale used by Birnbaum, Hirschberger, and Goldenberg (2011) for existing relationships. Sexual desire items were intermixed with nine filler items (e.g., "To what extent would you be interested in going for a walk with your partner?") to mask the nature of this questionnaire. Ratings were made on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). The nine items were internally reliable ($\alpha = .90$) and were thus averaged to form a global sexual desire index. Finally, both partners provided demographic information and were then carefully debriefed. No couple left until the research assistant was convinced that both partners felt good about their experience in the study.

Results and Discussion

Manipulation check. To examine whether the partner's responsiveness manipulation was adequately perceived as such by the disclosing partner, a 2 (partner responsiveness) \times 2 (event type) \times 2 (disclosing participant gender) ANOVA was conducted. Results yielded only a significant partner's responsiveness effect,

$F(1, 145) = 122.83, p < .001, \eta_p^2 = .459$. Perceived partner responsiveness was higher in the responsive confederate condition ($M = 4.25, SD = .69$) than in the unresponsive confederate condition ($M = 2.81, SD = .91$).

Responsiveness and sexual desire. To examine the effect of one's partner responsiveness on one's own self-reported desire and the potential moderation effects of event type and gender, we conducted a 2 (partner's responsiveness) \times 2 (event type) \times 2 (disclosing participant gender) ANOVA. We found a significant main effect for partner's responsiveness, $F(1, 145) = 4.79, p = .030, \eta_p^2 = .032$, indicating that participants reported greater desire when their partner was responsive ($M = 4.05, SD = .59$) than when the partner was unresponsive ($M = 3.81, SD = .82$).

The effect of partner's responsiveness on one's own desire was marginally moderated by gender, $F(1, 145) = 3.83, p = .052, \eta_p^2 = .026$. Probing the interaction yielded a significant responsiveness effect for women, $F(1, 145) = 7.89, p = .006, \eta_p^2 = .052$, but not for men, $F(1, 145) = 0.03, p = .865, \eta_p^2 = .000$, such that women experienced greater desire while interacting with a responsive partner ($M = 4.01, SD = .54$) than while interacting with an unresponsive one ($M = 3.53, SD = .88$). Men's desire in the responsive condition ($M = 4.08, SD = .64$) was not statistically different from their desire in the unresponsive condition ($M = 4.06, SD = .69$). The effect of responsiveness was not further moderated by event type, $F(1, 145) = 0.24, p = .622, \eta_p^2 = .002$, nor by the multiplicative effect of gender and event type, $F(1, 145) = 0.25, p = .615, \eta_p^2 = .002$.

We also found a significant gender effect, $F(1, 145) = 6.48, p = .012, \eta_p^2 = .043$, indicating that men ($M = 4.07, SD = .66$) experienced greater desire than women ($M = 3.77, SD = .76$). No significant effect was found for event type, $F(1, 145) = 0.02, p = .892, \eta_p^2 = .000$, nor for the event type by gender interaction, $F(1, 145) = 0.98, p = .323, \eta_p^2 = .007$.¹

To sum up, we found that women experienced greater sexual desire while interacting with a responsive partner than while interacting with an unresponsive partner, whereas men's desire was not significantly different in the two responsiveness conditions. Regardless of gender, event type had no significant influence on sexual desire. These findings indicate that, as expected, women's desire for their partners was more influenced by their partner's responsiveness than that of men. In fact, men's desire was not affected by their partner's responsiveness, suggesting that men are less likely to respond sexually to expressions of intimacy, at least within the context of a supportive online interaction. In this context, men's desire may be more dependent on innate drives than on interpersonal exchange (Baumeister, 2000). Women's desire, in contrast, is especially likely to be activated by good partner and parent indicators (Brase, 2006), such as responsiveness, for better or for worse. Partner responsiveness may lead women to engage more in activities that may further intensify a valued relationship, whereas partner unresponsiveness may lead them to withdraw from sexual activity with a less suitable partner.

Contrary to our expectations, this pattern of findings was observed for both negative and positive event disclosures, implying that the potential negative relational implications of being in need, which were documented in face-to-face interactions (Gable et al., 2006), may be less pronounced in the context of a brief online chat, in which self-esteem loss may be less noticeable. Another limitation of Study 1 is that we cannot rule out the possibility that the

ratings of perceived responsiveness and sexual desire reflect the general state of the relationship, as we did not assess relationship evaluations prior to manipulating responsiveness. These limitations were addressed in Study 2.

Study 2

Study 1 demonstrated that partner responsiveness during online chats is causally responsible for instigating the desire to have sex with this partner, but only in women. Study 2 aimed to replicate these findings in face-to-face interaction, a communication medium that provides continual nonverbal cues (which instant messaging, of course, does not). In face-to-face interaction, partners' impressions of each other are grounded not only in what they say but also in a variety of nonverbal cues (e.g., posture, gaze, and facial expression) that may affect their sexual responses. This may be particularly relevant to predicting men's sexual desire, as it is more likely than that of women to be influenced by implicit or visual cues (e.g., Gillath, Mikulincer, Birnbaum, & Shaver, 2007; Hamann, Herman, Nolan, & Wallen, 2004).

Study 2 also considered whether the effect of perceived partner responsiveness on self-reported sexual desire would concur with its effect on behavioral expressions of desire, as rated by judges. This potential correspondence might indicate that people's accounts of their own sexual desire can be observed by judges, ruling out a motivated construal process explanation (Reis & Gable, 2000). For similar reasons, we assessed both perceived and enacted partner responsiveness. However, given that emotional responses to a disclosure are more likely to be based on whether the individual believes that the partner has been responsive than on whether the partner has actually behaved that way (Clark & Lemay, 2010; Reis & Clark, 2013; Reis, Maniaci, & Rogge, 2014), we expected that the effect of perceived partner responsiveness on sexual desire would be stronger than the effect of enacted responsiveness. Specifically, in Study 2, we examined our hypotheses using a live interaction paradigm in which participants discussed a recent negative or positive event with their relationship partner, and then rated their partner's responsiveness and their desire to have sex with this partner. Following this procedure, partners were invited to engage in physical intimacy with each other. Both interactions progressed spontaneously while being videotaped, and were coded by two separate teams of trained independent judges for expressions of partner responsiveness and displays of sexual desire.

Method

Participants. One hundred seventy-eight heterosexual Israeli couples participated in this study in exchange for 150 NIS (about \$40 U.S.). 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 included in the sample if they were in a steady monogamous relationship of longer than 4 months. Women ranged in age from

¹ In all three studies, preliminary statistical analyses revealed that relationship length did not significantly interact with responsiveness in predicting sexual desire. We therefore dropped this variable from the final analyses.

19 to 41 years ($M = 24.04$, $SD = 2.97$), and in education from 12 to 20 years of schooling ($M = 12.98$, $SD = 1.42$). Men ranged in age from 20 to 48 years ($M = 25.45$, $SD = 3.40$), and in education from 7 to 23 years of schooling ($M = 13.18$, $SD = 1.74$). Forty-two percent of the couples were cohabiting and 9% were married. Three percent had children. Relationship length ranged from 4 to 168 months ($M = 32.73$, $SD = 27.64$).

Measures and procedure. Couples who agreed to participate in a study of personality and intimate interactions were scheduled to attend a single half-hour laboratory session, which followed the procedure of Birnbaum and Reis (2012, Study 1). Before the session, at home, each partner completed the Hebrew version of the Relationship Assessment Scale (RAS; Hendrick, 1988), which assesses relationship satisfaction. This scale, which was translated into Hebrew by Birnbaum and Reis (2006), consists of seven items rated on a 7-point Likert scale (e.g., "In general, how satisfied are you with your relationship?" and "To what extent has your relationship met your original expectations?"). The RAS is unidimensional, and we obtained an internal consistency estimate of .85 (Cronbach's alpha). Higher scores represented greater relationship satisfaction. In addition, each partner made a global rating of desire for the other partner ("To what extent have you been interested in having sex with your partner over the past 6 months?"), using a 7-point scale, with 1 being *not at all* and 7 being *extremely*.

Prior to each session, couples were randomly assigned to discuss either a positive or a negative event. When each dyad arrived at the lab, they were greeted by a research assistant who explained that the study involved discussing a recent personal event and randomly assigned partners to the role of discloser or responder by flipping a coin. The research assistant then asked disclosers to discuss a recent personal event and instructed responders to respond to, add to, or talk about as much or as little as they would under normal circumstances. All discussions, which lasted 7 to 10 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 led into separate rooms to ensure confidentiality. Disclosing partners completed the measure of responsiveness (Reis et al., 2011; $\alpha = .78$). Next, they were asked to think about how they felt right then and to complete a measure assessing their desire for their partner ($\alpha = .88$); both measures were the same as in Study 1. Upon completion of questionnaires, partners were reunited and invited to engage in mild acts of physical intimacy with each other (for up to 5 min), following the procedure of Gailliot and Baumeister (2007, Study 3). Instructions for engaging in acts of physical intimacy were as follows:

In the current stage of the study, we would like to explore how people express physical intimacy in their romantic relationships. You are going to be left alone in the room for five minutes while being videotaped during an intimate interaction. Please note that the videotapes will be used for research purposes only and will be strictly confidential. Now, we would like you to engage in an intimate interaction with each other, such as holding hands, kissing, hugging, making out. These are only example; feel free to express physical intimacy in any way that comes natural to you and makes you feel comfortable. You are, of course, allowed to stop the interaction at any moment. I will knock on the door before entering the room.

Couples were then informed that they would be video recorded during this interaction, and were left alone in the room. Finally, both partners were asked to provide demographic information and were then fully debriefed. No couple left until the research assistant was convinced that both partners felt good about their experience in the study.

Coding of partner's enacted responsiveness during the discussion. Two judges (psychology students) who were blind to the hypotheses and to participants' self-report data independently watched and rated each couple's discussion. Before making the ratings, judges were given detailed instructions and training on the rating procedure, which was based on the coding system developed by Maisel, Gable, and Strachman (2008). 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 7-point Likert scale ranging from 1 (*not at all*) to 7 (*a great deal*). The intraclass correlation (ICC) for each item was as follows: understanding = 0.93, validation = 0.97, caring = 0.90. We therefore averaged the two judges' scores to create measures of understanding, validation, and caring. Following Maisel et al. (2008), we used a composite score for global responsive behaviors (sum of understanding, validation, and caring) in subsequent analyses.

Coding of displays of sexual desire during the intimate interactions. The video-recorded intimate interactions were coded by a different team of two trained independent judges (psychology students) who did not watch the discussions of the personal events and were blind to the hypotheses. Each judge watched the interactions and rated each participant's overt non-verbal expressions of sexual desire (e.g., flirting, flashing seductive smiles, exchanges of penetrating gaze, petting one's body, cocking head to one side) in a single overall behavioral coding of sexual desire. Ratings were made on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*). This coding scheme has been used successfully in previous studies (Birnbaum, Mikulincer, Szepeswol, Shaver, & Mizrahi, 2014; Mizrahi, Hirschberger, Mikulincer, Szepeswol, & Birnbaum, *in press*). Interrater reliability was high (ICC = 0.88 for women and 0.91 for men). Hence, judges' ratings were averaged for each participant.

Results and Discussion

Preliminary analyses. Zero-order correlations and additional descriptive statistics are presented in Table 1. Perceived and enacted partner responsiveness were significantly associated with women's self-reported desire, but not with men's and women's displayed desire. Relationship satisfaction and global ratings of sexual desire, which were reported prior to the lab session, were associated with some measures of responsiveness and desire from the observed interactions. Because we wished to provide evidence for specific processes and not general feelings about a relationship, we included these variables as covariates in the primary analyses.

Primary analyses. Regression analyses were conducted to examine the association between responsiveness and desire, while including event type and gender as potential moderators. Specifi-

Table 1
Descriptive Statistics and Correlations Among Study Variables (Study 2)

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | Mean | SD |
|------------------------------|--------|--------|--------|--------|--------|--------|------|------|
| 1. Perceived responsiveness | — | .48*** | .30*** | .08 | .53*** | .28*** | 4.41 | .56 |
| 2. Self-reported desire | .16 | — | .36*** | .29*** | .31*** | .34*** | 3.97 | .58 |
| 3. Enacted responsiveness | .01 | -.06 | — | .23** | .28*** | .18 | 4.61 | 1.06 |
| 4. Displayed desire | .17 | .02 | .01 | — | .05 | .02 | 3.28 | 1.31 |
| 5. Relationship satisfaction | .36*** | .26** | .11 | -.07 | — | .52*** | 6.08 | .77 |
| 6. Global desire | .10 | .24** | .24** | -.18 | .34*** | — | 4.61 | .59 |
| Mean | 4.45 | 4.16 | 4.70 | 3.48 | 6.18 | 4.72 | | |
| SD | .45 | .57 | 1.16 | 1.60 | .72 | .58 | | |

Note. $N = 178$ couples. Only the disclosing partner's scores are included, except for enacted responsiveness, which reflects the responding partner's responsiveness as raters coded it. Above the diagonal are correlations for female disclosers; below the diagonal are correlations for male disclosers. Relationship satisfaction, global desire, and displays of responsiveness and desire were rated on 7-point Likert scales; self-reported responsiveness and desire were rated on 5-point Likert scales.

** $p < .05$. *** $p < .01$.

cally, a three-way design was modeled (i.e., Responsiveness \times Event Type \times Gender), in which relationship satisfaction and global desire were entered as covariates. The model was tested using the PROCESS macro in IBM SPSS (Hayes, 2013). All predictors were mean centered prior to analysis. We used both self-reported and behaviorally coded measures of partner responsiveness and sexual desire, which were either weakly correlated or uncorrelated. We therefore conducted four separate regression analyses, once each for either self-reported or behaviorally coded desire, as predicted by either self-reported or behaviorally coded partner responsiveness.

As can be seen in Table 2, perceived responsiveness was significantly associated with self-reported desire, and marginally associated with displays of desire, such that participants who perceived their partners as more responsive experienced higher levels of desire and expressed it behaviorally. These effects were not moderated by gender or event type. The significant statistical effects reported in Table 2 remained significant even when rela-

tionship satisfaction and global sexual desire were left out of the analyses.

As Table 3 shows, the main effect for behaviorally coded enacted responsiveness on sexual desire was not significant. However, the hypothesized interaction between enacted responsiveness and gender was significant for self-reported desire and marginally significant for behaviorally coded sexual desire. To probe these interactions, we followed Hayes's (2013) guidelines and computed conditional effects of responsiveness on desire for each gender. Results indicated that women reported higher levels of desire when their partners were more responsive ($B = .16$, standard error [SE] = .06, $\beta = .30$, $p < .01$). However, partners' displays of responsiveness were not associated with men's reported desire ($B = -.05$, $SE = .05$, $\beta = -.09$, ns). These conditional effects are presented in the left panel of Figure 1. A similar pattern emerged for desire displays, which is presented in the right panel of Figure 1. Women displayed marginally more desire when their partner was more responsive ($B = .27$, $SE = .15$, $\beta = .21$, $p < .07$),

Table 2
Predicting Self-Reported and Displayed Desire From Perceived Partner Responsiveness, Event Type, and Gender: A Regression Analysis (Study 2)

| Covariates and predictors | Self-reported desire | | | | Displayed desire | | | |
|--|----------------------|-----|-------------|---------|------------------|-----|--------------|---------|
| | B | SE | 95% CI | β | B | SE | 95% CI | β |
| Covariates | | | | | | | | |
| Relationship satisfaction | .06 | .06 | [-.07, .19] | .07 | -.04 | .19 | [-.41, .34] | -.02 |
| Global desire | .20*** | .07 | [.05, .35] | .20 | -.26 | .21 | [-.69, .16] | -.11 |
| Predictors | | | | | | | | |
| Perceived responsiveness | .27*** | .09 | [.10, .45] | .24 | .47* | .25 | [-.04, .97] | .17 |
| Event type | .04 | .08 | [-.12, .20] | .03 | -.38* | .23 | [-.84, .07] | -.13 |
| Gender | -.14* | .08 | [-.30, .02] | -.12 | -.20 | .23 | [-.65, .25] | -.07 |
| Relationship satisfaction | .06 | .06 | [-.07, .19] | .07 | -.04 | .19 | [-.41, .34] | -.02 |
| Global desire | .20*** | .07 | [.05, .35] | .20 | -.26 | .21 | [-.69, .16] | -.11 |
| Perceived Responsiveness \times Event Type | .09 | .16 | [-.23, .41] | .04 | -.58 | .47 | [-1.51, .35] | -.10 |
| Perceived Responsiveness \times Gender | .23 | .16 | [-.09, .55] | .10 | -.54 | .47 | [-1.47, .39] | -.10 |
| Gender \times Event Type | -.38** | .16 | [-.70, .07] | -.17 | -.16 | .45 | [-1.07, .74] | -.03 |
| Perceived Responsiveness \times Gender \times Event Type | .06 | .33 | [-.59, .71] | .01 | 1.36 | .95 | [-.52, 3.24] | -.11 |

Note. $N = 178$ couples. Event type: 0 = negative, 1 = positive; Gender: 0 = men, 1 = women. Relationship satisfaction, global desire, and displays of desire were rated on 7-point Likert scales; self-reported responsiveness and desire were rated on 5-point Likert scales. SE = standard error; CI = confidence interval.

* $p < .10$. ** $p < .05$. *** $p < .01$.

Table 3

Predicting Self-Reported and Displayed Desire From Enacted Partner Responsiveness, Event Type, and Gender: A Regression Analysis (Study 2)

| Covariates and predictors | Self-reported desire | | | | Behavioral desire | | | |
|---|----------------------|-----|-------------|---------|-------------------|-----|--------------|---------|
| | B | SE | 95% CI | β | B | SE | 95% CI | β |
| Covariates | | | | | | | | |
| Relationship satisfaction | .13** | .06 | [.00, .26] | .17 | .02 | .17 | [-.31, .36] | .01 |
| General desire | .19** | .08 | [.03, .35] | .19 | -.32 | .20 | [-.73, .09] | -.13 |
| Predictors | | | | | | | | |
| Behavioral responsiveness | .06 | .04 | [-.02, .14] | .11 | .13 | .10 | [-.08, .35] | .10 |
| Event type | .03 | .09 | [-.14, .07] | .03 | -.42* | .23 | [-.88, .04] | -.15 |
| Gender | -.15* | .09 | [-.37, .02] | -.13 | -.22 | .23 | [-.67, .24] | -.08 |
| Relationship satisfaction | .13** | .06 | [.00, .26] | .17 | .02 | .17 | [-.31, .36] | .01 |
| General desire | .19** | .08 | [.03, .35] | .19 | -.32 | .20 | [-.73, .09] | -.13 |
| Behavioral Responsiveness \times Event Type | .02 | .07 | [-.14, .18] | .02 | .50** | .21 | [.09, .92] | .19 |
| Behavioral Responsiveness \times Gender | .17** | .08 | [.01, .32] | .16 | .37* | .21 | [-.05, .79] | .14 |
| Gender \times Event Type | -.30* | .18 | [-.65, .05] | -.13 | .12 | .46 | [-.79, .04] | .02 |
| Behavioral Responsiveness \times Gender \times Event Type | -.07 | .16 | [-.38, .25] | -.03 | .30 | .42 | [-.53, 1.14] | .06 |

Note. $N = 178$ couples. Event type: 0 = negative, 1 = positive; Gender: 0 = men, 1 = women. Relationship satisfaction, global desire, and displays of responsiveness and desire were rated on a 7-point Likert scale. Self-reported desire was rated on a 5-point Likert scale. SE = standard error; CI = confidence interval.

* $p < .10$. ** $p < .05$.

whereas men's desire displays were not associated with their partners' responsiveness ($B = -.02$, $SE = .14$, $\beta = -.02$, ns). The magnitude and significance of these effects changed only slightly when the covariates were not included. Specifically, the effect of partner responsiveness on women's displayed desire, which was marginally significant when the covariates were included, was now significant ($B = .28$, $SE = .14$, $p < .05$).

The effect of partner's enacted responsiveness on participants' displays of desire was also moderated by event type, such that in the positive event disclosure condition, the more responsiveness partners expressed, the more desire the participants displayed ($B = .33$, $SE = .15$, $\beta = .25$, $p < .05$). In the negative event disclosure condition, partners' displays of responsiveness were not associated with participants' desire displays ($B = -.12$, $SE = .15$, $\beta = -.09$, ns). The significant statistical effects remained significant even when relationship satisfaction and global sexual desire were left out of the analyses.

Overall, we found that, regardless of event type and one's gender, participants who perceived their partners as more responsive reported and expressed higher levels of sexual desire. The

pattern of results was more complex for enacted responsiveness. Women reported and expressed higher levels of desire when their partners were more responsive. However, men's reported and enacted desire was not associated with their partners' displays of responsiveness. In addition, participants' desire displays were associated with partners' displays of responsiveness only in the positive event disclosure condition. All findings were obtained above and beyond relationship satisfaction and global desire.

These findings replicate and extend the main findings of Study 1 by showing that among women, partner's enacted responsiveness was associated not only with self-reported desire but also with observed displays of desire, whereas among men, partner's enacted responsiveness was not associated with either of them. And yet perceived partner responsiveness was associated with self-reported and displayed desire in both sexes. This pattern of results implies that men's desire is more affected by perceptions of responsiveness than by actual responsiveness, suggesting that men may be picking up on cues of responsiveness that are not visible to independent coders (an interpretation that is supported by the lower correlation for men between self-reported and behaviorally

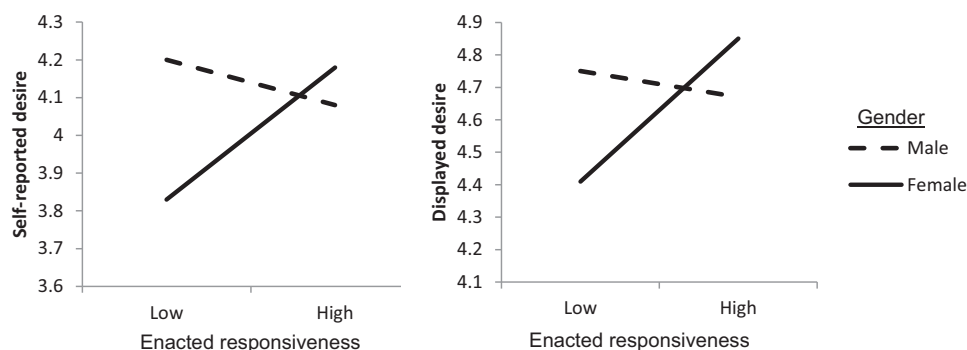


Figure 1. The contribution of enacted partner responsiveness to self-reported and displayed sexual desire in men and women.

coded responsiveness in Table 1). Of course, it may also be that men's judgments of partner responsiveness reflect bias to a greater extent than women's judgments do. For both sexes, perceived responsiveness was a stronger predictor of sexual desire than observer's coding of the partner's actual behavior, consistent with theoretical models that point to perceived partner responsiveness as proximate to behavior (Reis & Clark, 2013).

Study 2 also found that enacted responsiveness instigated desire following positive event disclosures, but not following negative event disclosures. This finding extends previous research revealing a similar, but less extreme, pattern for nonsexual aspects of the relationship (Gable et al., 2006). Specifically, it demonstrates the fragility of sexual desire and its susceptibility to changes in the contextual meaning of responsiveness. In the context of disclosing vulnerabilities, a partner's enacted expressions of responsiveness may lose their beneficial meaning and be less likely to render this partner desirable as the individual focuses on personal weaknesses or stressors.

Study 3

Studies 1 and 2 demonstrated the benefits that provision of responsiveness may have for instigating sexual desire, even in relatively brief interactions in an artificial lab setting. Study 3 was designed to determine whether these effects would apply in more natural settings. Additionally, Study 3 sought to explore the processes that underlie the responsiveness–desire linkage and to explain the gender differences shown in the first two studies. In particular, we examined whether the association between partner responsiveness and sexual desire would be mediated by a sense of feeling special and perceptions of partner mate value. For these purposes, we asked both members of romantic couples to complete a nightly diary for 6 weeks in which they recorded the quality of their relationship, their perceptions of partner responsiveness and mate value, their sense of feeling special, and their desire to engage in sex with their partner.

Method

Participants. One hundred heterosexual Israeli couples participated in this study in exchange for 400 NIS (about \$105 U.S.). To determine sample size, we estimated the relative power for the planned multilevel analysis using the PinT V2.1 computer program (Bosker, Snijders, & Guldemon, 2003). Although PinT was originally developed for power analyses of discrete predictors, Raudenbush and Liu (2001) noted that approximations are possible in cases with continuous explanatory variables. Power for a random coefficient model was estimated for a sample of 100 couples and 42 time periods, with a moderate effect size (.30 in a correlation metric). Estimation of the standard errors assuming $\alpha = .05$ yielded a power of .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) agreed to report on their daily sexual and relationship perceptions, desires, feelings, and behaviors each evening for a period of 42 days; and (c) 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 in education from 12 to 19 years of schooling ($M = 13.35$, $SD = 1.65$). Men ranged in age from 21 to 35 years ($M = 25.60$, $SD = 2.70$), and in education from 10 to 20 years of schooling ($M = 13.58$, $SD = 2.00$). 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 to complete the diary questionnaires. Participants were instructed to fill out the questionnaires independently and to refrain from discussing responses with their partner until completion of the study. E-mails 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 week to improve compliance with the diary protocol. In addition, we sent reminder e-mails to participants who had not completed their daily diaries by midnight each night. At the end of the study, both partners were debriefed and thanked for their participation.

Daily-level measures. On each diary day, participants completed measures of relationship quality, perceived partner responsiveness and mate value, a sense of feeling special, and sexual desire, and reported whether they had engaged in sex with their partner. We used measures with a single item or a few items to minimize participant attrition (Bolger, Davis, & Rafaeli, 2003). All daily items were rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*), unless reported otherwise. To estimate scale reliability at the daily level, we created an additional item level (nested within days and person) and ran a three-level unconditional model in HLM 7 software (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011), as suggested by Nezlek (2012). HLM estimates the reliability of the item-level intercept, which is equivalent to Cronbach's alpha.

Relationship quality. Participants rated relationship quality with their partner on each day. Ratings were made on a 5-point scale, ranging from 1 = *poor* to 5 = *excellent*.

Perceived partner responsiveness. Perceived partner responsiveness was measured with six items, similar to those used in Study 1, adapted to reflect daily perceptions (e.g., "Today my partner has expressed liking and encouragement for me"; "Today my partner seemed interested in what I was thinking and feeling"; $\alpha = .89$).

Perceived partner mate value. Participants completed six items assessing their daily perceptions of their partner's desirability as a mate (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"; $\alpha = .80$).

A sense of feeling special. Participants completed two items assessing the extent to which their partner made them feel special and their relationship felt unique on that day ("My partner has made me feel special"; "My partner has made me feel that our relationship is special and unique"; $\alpha = .83$).

Sexual desire. Sexual desire was measured with six items, similar to the ones reported in Study 1, adapted to reflect daily experiences (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"; $\alpha = .86$).

Confirmatory factor analysis. To verify that perceived partner responsiveness, perceived partner's mate value, and the sense of feeling special are distinct variables, we conducted a confirmatory factor analysis on these items. Fit indices of a three-factor model were adequate ($\chi^2 = 7,769.84$, $df = 64$, $p < .000$, normed fit index [NFI] = .92, comparative fit index [CFI] = .92, root mean square error of approximation [RMSEA] = .12). Most importantly, we compared the fit indices of the three-factor model with an alternative one-factor model, in which all the items loaded on a single factor. The one-factor model had poor fit ($\chi^2 = 24,784.92$, $df = 65$, $p < .000$, NFI = .76, CFI = .76, RMSEA = .21). Moreover, the three-factor model fitted the data significantly better than the one-factor model ($\Delta\chi^2 = 17,015.08$, $df = 1$, $p < .000$). Together, these results indicate that the three scales can be treated as separate constructs.

Results and Discussion

Because of the nested structure of these data, we ran a two-level hierarchical model for dyadic diary data, in which slopes and intercepts were assessed simultaneously for both partners. The lower level represents variability related to within-person repeated measures separately for male partners and female partners, whereas the upper level represents between-couple variability across male partners and across female partners (see Laurenceau & Bolger, 2005; Raudenbush, Brennan, & Barnett, 1995, for more details). This method allows the error terms in Level 1 to correlate and thus better estimates the error structure of the repeated dyadic data than a three-level model (i.e., days nested within persons nested within couples) does.

All analyses included four sets of control variables. First, to control for time-related artifacts, the elapsed time in days was included as a linear trend, as recommended by Bolger and Laurenceau (2013). Second, to rule out daily serial dependency in the outcome variable, we controlled for the previous day's outcome variable. For example, in predicting today's sexual desire, yesterday's sexual desire was partialled out. Third, we controlled for daily relationship satisfaction to better identify unique effects of partner responsiveness over and above the general affective tone of the relationship. Lastly, as advocated by Bolger and Laurenceau,

we controlled for between-person averages (e.g., the average self-reported responsiveness aggregated across all 42-diary days) for all primary variables. Because we focused on the day-to-day level, all within-person predictors were first grand centered on their gender mean, and then person mean-centered. The time trend was centered on the middle of the time span (i.e., 23rd day). For the within-person predictors, intercepts and slopes were allowed to vary for both female and male partners, but other effects were estimated as fixed effects.

We used a multilevel mediation analysis to test whether the association between perceived partner responsiveness and sexual desire at the daily level could be explained by feeling special and partner mate value (Preacher, Zyphur, & Zhang, 2010). The two mediators were tested at the same equation thus competing for explained variance. The significance of the indirect effects was estimated by the 95% confidence intervals of 5,000 bias-corrected and accelerated bootstrapping analyses (MacKinnon, Lockwood, & Williams, 2004). Moreover, the path coefficients in the mediation model were tested for gender differences. Figure 2 shows the final moderated mediation model.

Results of the multilevel analyses are presented in Table 4. The first set of equations (Section I of Table 4) indicated that for both women and men, daily perceived partner responsiveness was associated with significantly higher levels of daily sexual desire. Further analysis examined the extent to which these responsiveness–desire associations differed across gender. To do so, we pooled the female and male effects and examined whether gender moderated this pooled effect. The Gender \times Responsiveness interaction was not significant ($B = .02$, $SE = .02$, $t(72) = 1.23$, $p = .221$, 95% confidence interval [CI] [−.01, .06]). These findings support our hypothesis that partner responsiveness is associated with desire for this partner among both women and men. Importantly, this association was evident in day-to-day variation while controlling for between-person mean levels of responsiveness, yesterday's desire, time, and daily relationship satisfaction.

In the second and third analyses (Sections II and III of Table 4), we examined the association between perceived partner responsiveness and the two mediators, feeling special and mate value.

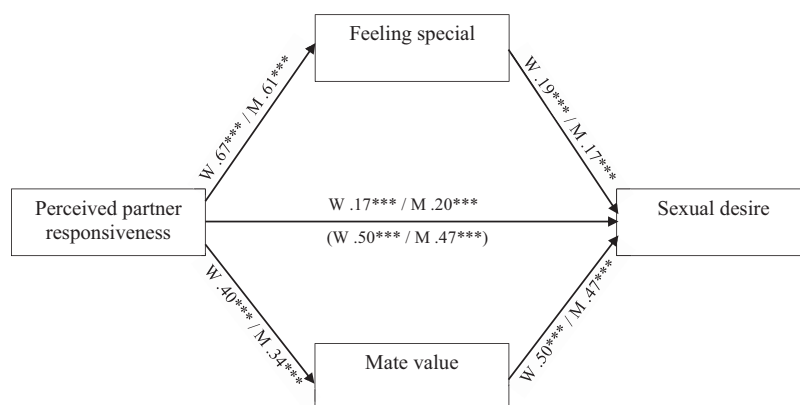


Figure 2. Moderated-mediation model showing that feelings special and perceived partner mate value mediated the association between perceived partner responsiveness and sexual desire in Study 3. Path coefficients are unstandardized, values in parentheses are total effects. W = women; M = men. *** $p < .001$.

Table 4

Total, Direct, and Indirect Effects of Responsiveness on Desire Through Mate Value and Feeling Special: A Multilevel Mediation Analysis (Study 3)

| Effects | B | SE | <i>t</i> | <i>p</i> | 95% CI |
|--|-------|-------|----------|----------|-----------------|
| I. Dependent variable model (DV = desire) | | | | | |
| W_Intercept | 3.83 | .058 | 65.55 | <.000 | [3.71, 3.94] |
| M_Intercept | 3.91 | .047 | 83.02 | <.000 | [3.81, 3.99] |
| W_Responsiveness | .50 | .032 | 15.84 | <.000 | [.44, .57] |
| M_Responsiveness | .47 | .027 | 17.01 | <.000 | [.41, .52] |
| W_Time | .0019 | .0010 | 1.88 | .060 | [−.0001, .0038] |
| M_Time | .0008 | .0010 | .82 | .410 | [−.0011, .0028] |
| W_Desire (yesterday) | −.05 | .018 | 2.75 | .007 | [−.08, −.01] |
| M_Desire (yesterday) | −.07 | .016 | 4.22 | <.000 | [−.10, −.03] |
| W_Satisfaction | .21 | .025 | 8.36 | <.000 | [.16, .26] |
| M_Satisfaction | .19 | .024 | 8.13 | <.000 | [.14, .24] |
| Mean W_Responsiveness | .69 | .095 | 7.25 | <.000 | [.50, .87] |
| Mean M_Responsiveness | .83 | .068 | 12.07 | <.000 | [.69, .96] |
| II. Mediator variable model (DV = feeling special) | | | | | |
| W_Intercept | 3.98 | .043 | 91.79 | <.000 | [3.89, 4.07] |
| M_Intercept | 3.78 | .039 | 95.93 | <.000 | [3.70, 3.86] |
| W_Responsiveness | .67 | .028 | 23.95 | <.000 | [.62, .73] |
| M_Responsiveness | .61 | .024 | 25.46 | <.000 | [.57, .66] |
| W_Time | .0007 | .0007 | .99 | .323 | [−.0006, .0022] |
| M_Time | .0005 | .0007 | .74 | .459 | [−.0021, .0019] |
| W_Feeling special (yesterday) | .04 | .013 | 3.10 | .003 | [.014, .066] |
| M_Feeling special (yesterday) | .03 | .015 | 2.04 | .045 | [−.001, .060] |
| W_Satisfaction | .27 | .027 | 9.91 | <.000 | [.22, .32] |
| M_Satisfaction | .24 | .025 | 9.64 | <.000 | [.19, .29] |
| Mean W_Responsiveness | 1.11 | .080 | 13.92 | <.000 | [.95, 1.27] |
| Mean M_Responsiveness | 1.14 | .063 | 17.98 | <.000 | [1.01, 1.26] |
| III. Mediator variable model (DV = mate value) | | | | | |
| W_Intercept | 4.27 | .039 | 109.30 | <.000 | [4.20, 4.35] |
| M_Intercept | 4.20 | .040 | 104.60 | <.000 | [4.12, 4.28] |
| W_Responsiveness | .40 | .024 | 16.70 | <.000 | [.35, .45] |
| M_Responsiveness | .34 | .020 | 16.55 | <.000 | [.30, .38] |
| W_Time | .0017 | .0005 | 3.52 | <.000 | [.0008, .0027] |
| M_Time | .0006 | .0005 | 1.19 | .234 | [−.0004, .0015] |
| W_Mate value (yesterday) | .06 | .016 | 3.64 | .001 | [.027, .091] |
| M_Mate value (yesterday) | .03 | .015 | 1.99 | .051 | [−.001, .061] |
| W_Satisfaction | .15 | .018 | 8.36 | <.000 | [.11, .18] |
| M_Satisfaction | .12 | .017 | 7.38 | <.000 | [.09, .16] |
| Mean W_Responsiveness | .73 | .065 | 11.16 | <.000 | [.60, .86] |
| Mean M_Responsiveness | .71 | .060 | 11.81 | <.000 | [.59, .83] |
| IV. Dependent variable model (DV = desire) | | | | | |
| W_Intercept | 3.83 | .049 | 78.52 | <.000 | [3.74, 3.93] |
| M_Intercept | 3.91 | .041 | 94.14 | <.000 | [3.82, 3.99] |
| W_Responsiveness | .17 | .034 | 4.99 | <.000 | [.10, .24] |
| M_Responsiveness | .20 | .029 | 6.99 | <.000 | [.14, .26] |
| W_Feeling special | .19 | .022 | 8.83 | <.000 | [.15, .24] |
| M_Feeling special | .17 | .022 | 7.89 | <.000 | [.13, .22] |
| W_Mate value | .50 | .041 | 12.12 | <.000 | [.42, .58] |
| M_Mate value | .47 | .039 | 11.86 | <.000 | [.39, .55] |
| W_Time | .0003 | .0008 | .34 | .734 | [−.0014, .0020] |
| M_Time | .0001 | .0008 | .02 | .982 | [−.0016, .0016] |
| W_Desire (yesterday) | −.006 | .017 | .35 | .728 | [−.04, .03] |
| M_Desire (yesterday) | −.011 | .017 | .65 | .519 | [−.04, .02] |
| W_Satisfaction | .08 | .023 | 3.42 | .001 | [.03, .13] |
| M_Satisfaction | .10 | .023 | 4.40 | <.000 | [.05, .15] |
| Mean W_Responsiveness | −.22 | .146 | 1.54 | .128 | [−.52, .07] |
| Mean M_Responsiveness | .34 | .118 | 2.87 | .005 | [.10, .57] |
| Mean W_Feeling special | .27 | .095 | 2.89 | .005 | [.09, .46] |
| Mean M_Feeling special | .13 | .092 | 1.40 | .165 | [−.05, .31] |
| Mean W_Mate value | .74 | .108 | 6.85 | <.000 | [.53, .96] |
| Mean M_Mate value | .45 | .090 | 5.00 | <.000 | [.27, .63] |

Note. *N* = 100 couples. All daily items were rated on a 5-point scale. *SE* = standard error; *CI* = confidence interval; *DV* = dependent variable; *W* = women; *M* = men.

Results indicated that for each gender, partner responsiveness was significantly associated with feeling more special (women: $B = .67$, $SE = .028$, $p < .001$; men: $B = .61$, $SE = .024$, $p < .001$) and with higher mate value (women: $B = .40$, $SE = .024$, $p < .001$; men: $B = .34$, $SE = .020$, $p < .001$), such that on days when participants perceived their partners as more responsive, they also felt more special and perceived their partners as more valuable. Although these effects were significant for male and female partners, further analyses of the gender by responsiveness interactions indicated that the effects for female partners were significantly stronger than for male partners in predicting both feeling special ($B = .04$, $SE = .02$, $t(72) = 1.99$, $p = .049$, 95% CI [.00, .07]) and mate value ($B = .03$, $SE = .01$, $t(72) = 2.60$, $p = .011$, 95% CI [.01, .06]).

In the fourth analysis (Section IV of Table 4), we examined whether these two mediators were uniquely associated with sexual desire, controlling for partner responsiveness. Results indicated that for both male and female partners, feeling unique and mate value were significantly associated with an increase in sexual desire. In this analysis, gender did not moderate either the effect of feeling special ($B = .01$, $SE = .01$, $t(72) = 0.88$, $p = .380$, 95% CI [−.02, .04]) or that of mate value ($B = .02$, $SE = .02$, $t(72) = 0.79$, $p = .439$, 95% CI [−.03, .07]).

Then, to test whether feeling special and partner mate value mediated the association between perceived partner responsiveness and sexual desire, we calculated the 95% CI of these indirect effects using 5,000 bias-corrected and accelerated bootstrapped samples. Results indicated that the 95% CI of the indirect effects for perceived partner responsiveness as a predictor of sexual desire through feeling special (women's 95% CI [.09, .17]; men's 95% CI [.07, .14]) and mate value (women's 95% CI [.14, .26]; men's 95% CI [.11, .20]) did not include zero and thus is considered significant. This finding indicates that the association between partner responsiveness and desire for this partner is mediated by feeling special and by perceptions of partner mate value.²

Finally, we examined whether sexual desire predicted engagement in sexual intercourse. Because engagement in sexual intercourse is a binary outcome, we ran a two-intercepts, two-level hierarchical dyadic model, using the generalized estimating equations (GEEs), which estimate multilevel logistic functions (Heck, Thomas, & Tabata, 2013). For both women ($B = 1.48$, $SE = .12$, $Wald = 176.40$, $p < .001$) and men ($B = 1.36$, $SE = .13$, $Wald = 118.84$, $p < .001$), higher desire was associated with engagement in sexual intercourse. As expected, our findings showed that sexual desire mediated the association between perceived partner responsiveness and engagement in sexual intercourse (women's 95% CI [.63, .93]; men's 95% CI [.46, .73]).³

In sum, we found that for both women and men, daily perceived partner responsiveness was associated with significantly higher levels of daily sexual desire. On days when participants perceived their partners as more responsive, they also felt more special and perceived their partners as more valuable, but these associations were stronger for women than for men. Feeling more special and perceiving one's partner as more valuable, in turn, predicted greater desire for sex with one's partner in both sexes. Overall, Study 3 demonstrated that the findings of Studies 1 and 2 generalized to everyday life, even when controlling for relationship quality, further illustrating the role of perceptions of partner responsiveness in sustaining desire in ongoing relationships. In par-

ticular, the findings indicate that perceiving a partner as responsive makes the relationship feel special and the partner seem valuable and thus sexually desirable. Responsiveness is crucial to relationship well-being (Reis & Clark, 2013), and thus it is not surprising that it serves as a potent "good partner" indicator that affects sexual desire. However, responsive partners were not only seen as making one feel valued—as indexed by our "feeling special" variable—but were also perceived as better potential mates for anyone.

Indeed, desire is theorized to function as a visceral gauge of mate suitability, with higher (vs. lower) sexual desire inducing greater exertions toward the deepening of romantic relationships (Birnbau & Finkel, 2015). As such, the desire for one's partner should reflect potential changes in partner responsiveness and the resulting changes in this partner's mate value, motivating the individual to either maintain a relationship with a valuable partner or end the relationship with a less valuable partner. This was true for both men and women, although responsiveness had a significantly stronger effect on women's perceptions of their partners. Ample research indicates that women are more selective when choosing mates than men (Sadalla, Kenrick, & Vershure, 1987; Trivers, 1972), and that they emphasize their partner's potential as a good provider more than men do (e.g., Buss, 1989; Kenrick et al., 1990). Although prior research has largely emphasized financial providing, responsiveness may also be indicative of this attribute.

General Discussion

Sexual desire tends to diminish gradually over time, with many long-term relationships failing to sustain it (e.g., Acker & Davis, 1992; Birnbau et al., 2007; Michael, Gagnon, Laumann, & Kolata, 1994). Fortunately, scholars have identified several processes that may help maintain sexual desire in long-term relationships (e.g., a positive relational approach, a communal approach to sexual interactions; Impett, Strachman, Finkel, & Gable, 2008; Muise, Impett, & Desmarais, 2013; Muise, Impett, Kogan, et al., 2013). Our research adds to this literature by demonstrating that sexual desire thrives on rising intimacy, and that being responsive to a partner's needs is a promising way to instill and maintain this elusive sensation over time.

In three studies, we show that a partner's provision of responsiveness outside the bedroom contributes to the desire to have sex with this partner, and we help explain why women's desire is more strongly affected by their partner's responsiveness than men's desire. Study 1 experimentally manipulated partner responsiveness while employing computer-mediated interactions, and found that enacted partner responsiveness increased the desire for sex with this partner, but primarily in women. Study 2 replicated these findings in relatively naturalistic conditions (live face-to-face, spontaneous intimate interactions) and extended them by demon-

² All the analyses were also conducted without controlling for relationship satisfaction and the previous day's outcome variables. The magnitude and significance of the hypothesized effects were slightly higher, when the covariates were not included.

³ Having sex did not moderate the effect of responsiveness on desire ($B = -.01$, $SE = .02$, $t(71) = 1.14$, $p = .255$), nor did it moderate the effects of responsiveness on feeling special ($B = -.01$, $SE = .02$, $t(71) = 0.71$, $p = .480$) and perceived partner mate value ($B = .01$, $SE = .01$, $t(71) = 1.10$, $p = .278$).

strating that partner's enacted responsiveness was associated not only with self-reported desire but also with observed displays of desire, but once again mainly in women. Nevertheless, perceived partner responsiveness was associated with self-reported and displayed desire in both sexes. Study 3 employed a daily experiences methodology and indicated that these findings generalize to everyday life. In addition, the findings of Study 3 revealed that for both men and women, perceiving a partner as responsive makes one feel special and the partner seem valuable and thus sexually desirable. Still, partner responsiveness had a significantly stronger effect on women's self- and other perceptions, suggesting that women experienced higher levels of desire for their responsive partner because they were more likely than men to feel special and value this partner as a result of the partner's responsiveness.

These findings extend previous results in several ways. First, although past studies have used both cross-sectional and longitudinal designs, their designs are correlational and thus do not allow for causal conclusions. Second, previous studies were based on self-reported experiences of intimacy and desire rather than observed displays of actual intimacy and desire, which would allow us to rule out a motivated construal process explanation for our findings (Reis & Gable, 2000).⁴ Third, prior research has not investigated whether momentary expressions of responsiveness matter over and above relationship evaluations, and therefore prior work could not rule out the possibility that perceptions of intimacy and sexual desire reflect the general state of a relationship. Finally, previous research has not explored why perceptions of intimacy translate into sexual desire in romantic relationships.

Overall, our findings firm up a causal connection between partner responsiveness and sexual desire, highlighting the importance of intimacy-related processes to instigating desire within the context of ongoing relationships. In the early stages of emerging relationships, partners typically experience relatively strong and spontaneous sexual urges. However, as relationships develop, couples often experience habituation of sexual response, such that sexual desire begins to reflect general interpersonal circumstances rather than a spontaneous event (Basson, 2000; Baumeister & Bratslavsky, 1999). Our study suggests that it is precisely in this stage, when many couples express lower levels of passion and physical intimacy (Acker & Davis, 1992; Guerrero & Andersen, 1991), that the provision of responsiveness may have the greatest potential to influence sexual desire, for better or for worse. In particular, partners' expressions of responsiveness outside the bedroom may increase the desire for sex, so as to create an even more intimate experience with these partners and to further promote the relationship. In contrast, partners' lack of responsiveness may engender negative affect and cognitions toward these partners (e.g., disappointment, anger, doubts regarding the commitment of the partner) that are likely to inhibit desire for them.

Our evidence indicates that partner responsiveness plays a key role not only in fostering intimacy between partners, as has been shown by previous studies (e.g., Laurenceau, Barrett, & Rovine, 2005; Reis et al., 2004), but also in instigating desire. In particular, our findings offer the fresh insight that it is not the general sense of intimacy per se that counts, but rather the specific sense of uniqueness and perceptions of a partner's mate value that responsiveness may inspire. In other words, couple interactions may require more than mere displays of intimacy to enhance desire;

they may instead benefit more from the particulars provided by a heightened sense of responsiveness.

When a partner is perceived to be truly responsive, he or she conveys not only intimate knowledge of one's needs, emotions, and thoughts, but also appreciation for the value of these attributes and concern for one's welfare (Gable et al., 2006; Reis & Clark, 2013). Perceived responsiveness helps a relationship feel special and unique, and a partner to be viewed in positive terms, as one who is desirable and worth pursuing. Less personal manifestations of intimacy, such as familiarity and comfort with each other's company, are not necessarily based on this sort of shared recognition of oneself and what one truly wants, and may therefore be less likely to generate the underlying feelings that seem to be crucial to instigating desire in a long-term relationship.

Our findings indicate that women are particularly attuned to such distinctive expressions of responsiveness, and consequently, their self- and other-perceptions, as well as their sexual desire, are more likely than those of men to be affected by them. These findings mesh well with the contention and related evidence that relational context has a stronger influence on women's sexual desire than on men's sexual desire (e.g., Baumeister, 2000; Birnbaum, Mikulincer, & Austerlitz, 2013; Diamond, 2003). It is also consistent with Basson's (2000) model of sexual response, which asserts that for many women, particularly those involved in long-term relationships, the willingness to experience sexual arousal and subsequent desire is regulated more by intimacy needs than by spontaneous urges.

Additionally, the current findings shed light on why such expressions of responsiveness are particularly potent in influencing women's sexual desire. A responsive partner is likely to be perceived not only as one who is willing to invest in the relationship but also as one who knows what it takes to invest well—that is, to be a good partner and parent. Given that women, compared with men, pay greater reproductive costs for choosing an unsuitable mate (Buss & Schmitt, 1993; Trivers, 1972), it is hardly surprising that a good partner indicator, such as responsiveness, has a greater effect on their sexual desire, motivating them to deepen a relationship with a valued partner. Indeed, it has often been theorized that sexual activity serves a relationship maintenance function, in the sense of reinforcing the pair bond between committed partners and coparents (Birnbaum, 2014; Birnbaum & Finkel, 2015). Because these interests are also relevant to men's long-term mating priorities and effectiveness (Buss & Schmitt, 1993), it is not surprising that responsiveness did also contribute to men's sexual desire in Studies 2 and 3, albeit less influentially than for women.

Previous studies, which focused on initial acquaintanceships, have also shown that men and women react differently to such expressions of responsiveness. However, those studies revealed a substantially different pattern, namely, that women's desire was adversely affected by partner responsiveness (Birnbaum et al., 2014; Birnbaum & Reis, 2012). These discrepancies can be reconciled by considering variations in relationship stage and the divergent meaning that partner responsiveness may convey in

⁴ Of course, we do not mean to suggest that motivated construal does not contribute to sexual desire in long-term relationships. Rather, we simply note that motivated construal does not fully explain the link between responsiveness and sexual desire.

early and later stages of a relationship. In a first meeting, high levels of responsiveness might be considered manipulative and an indication of doubtful relational intentions, whereas in a committed relationship, responsiveness is more likely to signal caring and concern, and hence desirability as a long-term partner. Together, these findings indicate that the contextual meaning of displays of responsiveness plays a greater role in women's sexual reactions to such displays than men's, adding to what is known about the context sensitivity of men and women's desire. Men's sexual desire is relatively more spontaneous (Basson, 2000) and driven by cues of sexual availability (Birnbaum et al., 2014). Women's desire, in contrast, is more context-dependent and functions as a gatekeeper in the relationship development processes, ensuring that only valuable relationships will be maintained (Birnbaum & Reis, 2012).

Conclusions

Our findings show that in long-term relationships, daily responsiveness cues facilitate sexual desire for both men and women, primarily when these cues instill the sense that the partner is valuable and that the relationship is special. However, although these findings suggest that intimacy-related processes help sustain desire in women in all studied contexts, they are less conclusive about the mechanism that underlies men's desire in long-term relationships. One question concerns gender differences in the contribution of partner responsiveness to sexual desire, which were more notable in the laboratory context than in the diary study. Because our laboratory studies assessed responsiveness under different circumstances than in the diary study (disclosure of personal events vs. unspecified daily relationship context), it is unclear whether these gender differences reflect variations in relational context or the impact of ecological validity. Future research is needed to address these possibilities by examining the effects of responsiveness on desire in more diverse relational contexts (e.g., intimate conversations, conflicts, threats) and in other ecologically valid settings. In doing so, research should explore whether perceptions of partner responsiveness in these different contexts elicit different goals (e.g., sexual vs. nonsexual) in men and women that, in turn, may affect their desire differently.

This possibility resonates with findings that, compared with women, men are more likely to be motivated to engage in sex by recreational, self-serving needs (e.g., the quest for sexual gratification, adventure, and novelty) than for intimacy-related reasons (Carroll, Volk, & Hyde, 1985; Meston & Buss, 2007). Sexual motives, however, vary across circumstances (e.g., Birnbaum, Weisberg, & Simpson, 2011), such that partner responsiveness may still have a strong effect on men's sexual desire in certain circumstances. For example, a partner's responsiveness may be especially likely to increase a man's desire for this partner under relationship-threatening circumstances. Such circumstances may activate proximity-seeking goals (Mikulincer, Gillath, & Shaver, 2002), and may thus create an opportunity for men to use sex as a means of becoming close to their partner, believing that this partner is likely to respond positively to their advances. Future studies should further investigate whether the effect of responsiveness on desire in men is context-dependent, and whether other, not yet studied, processes (e.g., uncertainty reduction) are effective in sustaining men's desire in these contexts.

Even though men's sexual reaction to expressions of responsiveness was less consistent than that of women, they still benefit from it, as demonstrated in Studies 2 and 3. These findings challenge the intimacy-desire paradox, which indicates that high levels of intimacy inhibit, rather than increase, sexual desire (e.g., Ferreira et al., 2012; Lobitz & Lobitz, 1996; Perel, 2007). Some scholars have argued that the core of this paradox lies in the contradiction between the intimate and familiar relational environment that many people strive for and the limitations of such an environment for facilitating desire (Sims & Meana, 2010). In particular, the need for security that intimacy typically provides may clash with the sense of uncertainty, novelty, and separateness that fuels desire, such that high levels of intimacy between partners may stifle sexual desire (e.g., Ferreira et al., 2012; Perel, 2007). Unfortunately, because we did not assess novelty or distance-related constructs (e.g., separateness, differentiation, enmeshment), we cannot compare the relative effects of responsiveness and novelty on desire, nor can we determine whether a curvilinear association exists, such that desire is low at both very low and high levels of intimacy. Moreover, because we did not assess other aspects of intimacy (e.g., familiarity, comfort with each other's company), we cannot determine whether responsiveness per se promotes desire rather than general intimacy or certain aspects of intimacy.

Our data also do not allow us to test the hypothesis that the directional effect of intimacy on sexual desire depends on individual differences, such that for some people expressions of intimacy may lead to a decline in desire. Indeed, this rival hypothesis has been offered, based on samples of individuals who were diagnosed with hypoactive sexual desire disorders (Lobitz & Lobitz, 1996; Sims & Meana, 2010). Our samples, in contrast, were composed of young, sexually active individuals in relatively high-functioning relationships of moderately short duration. This emphasis precludes conclusions about the influence of responsiveness on sexual desire in very long-term relationships.

Notwithstanding these limitations, our research is the first to establish a causal link between expressions of responsiveness and sexual desire in ongoing relationships, thereby helping to elucidate the intimacy-desire paradox and suggesting that, under certain circumstances, it may not be a paradox. In particular, our research demonstrates that what determines whether intimacy instigates or inhibits desire is not its mere existence, but its contextual meaning. Responsiveness is most likely to instigate desire when it conveys the impression that the partner is worth pursuing and when engaging in sex with such a desirable partner is likely to promote an already valuable relationship. Future research is needed to examine whether other aspects of intimacy (e.g., familiarity, being able to be vulnerable, increased emotional connection) have similar effects on sexual desire, whether these effects change in long-term relationships, and how they affect relationship quality and longevity in more heterogeneous samples.

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