

Not in the Mood? Men Under- (Not Over-) Perceive Their Partner's Sexual Desire in Established Intimate Relationships

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Men's sexual overperception bias—where men tend to perceive greater sexual interest in women's behavior than actually exists—is a well-documented finding in previous research. All of the existing research, however, has tested this effect in the context of initial encounters or for fictitious or unknown targets. No research currently exists on how people perceive their romantic partner's sexual desire in the context of ongoing, intimate relationships. In 3 dyadic studies, we provide evidence that men in established romantic relationships err in the direction of the *opposite* bias and *underperceive* their romantic partner's sexual desire. We also demonstrate that this underperception bias is functional (particularly for men) in that it is associated with their partner feeling more satisfied and committed to the relationship. In addition, people are particularly likely to underperceive their partner's desire on days when they are motivated to avoid sexual rejection, and men's underperception bias is, in part, accounted for by men's higher general levels of sexual desire than women. The current studies extend previous findings on sexual perceptual biases and demonstrate the important role of context in men's judgments of a partner's sexual interest.

Keywords: evolutionary theory, men's sexual overperception bias, romantic relationships, sexual rejection, sexual desire

Knowing when a romantic partner wants to have sex and when they are not in the mood is not always easy in long-term relationships. Amid demanding work schedules, household responsibilities, and caring for children, staying attuned to a romantic partner's sexual interests can be challenging. As a result, people can make a variety of errors when trying to gauge their partner's interest in sex. For one, they could underperceive their partner's sexual interest (i.e., perceive that their partner is not interested in sex when the partner is in fact interested) and miss out on important opportunities for sexual intimacy. Alternatively, they could overperceive their partner's interest (i.e., perceive that their partner is interested in sex when the partner in fact is not) and this could lead

them to become complacent about attracting their partner's interest or to risk initiating sex at a time when their feelings are not likely to be reciprocated, perhaps resulting in painful feelings of sexual rejection. How do romantic partners balance the risk of missing an opportunity for sexual connection with the risk of overperceiving a partner's sexual interest?

Evolutionary psychologists have an answer to this question—at least for men—backed by theory and a wealth of empirical data. They contend that, because it is more reproductively costly for men to miss a potential mating opportunity than to perceive that a woman is interested in sex when she actually is not, men display an *overperception bias* wherein they systematically perceive more sexual interest in a woman's behavior than actually exists (Haselton & Buss, 2000; Henningsen & Henningsen, 2010). All of the existing studies on men's sexual overperception bias, however, have focused exclusively on initial sexual interest among strangers or judgments of sexual interest of a fictitious or unknown person. In the current research, we test, for the first time, the prediction that in the context of *established intimate relationships*, men will err in the direction of the opposite bias and *underperceive* their romantic partner's sexual desire.

Men's Sexual Overperception Bias in Initial Encounters

Men's sexual overperception bias, the tendency for men to perceive more sexual interest in women's behavior than actually exists, has been well-documented in previous research. Error management theory (EMT; Haselton & Buss, 2000; Haselton & Galp-

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erin, 2013) indicates that when people make judgments about ambiguous stimuli, they can err in two ways; they can either indicate that an event has taken place when it has not occurred (i.e., overperception bias), or they can fail to detect an event when it has in fact occurred (i.e., underperception bias). Because the costs associated with these two errors are rarely symmetrical in nature, EMT proposes that decision-making adaptations have evolved to commit the errors that are less costly—even if produced at higher rates—because they led to survival and reproductive advantages for humans in the past. As a result of gender differences in parental investment, where women are required to invest more time and energy in offspring than men, women tend to be more selective in choosing sexual partners compared to men, who can increase their reproductive success by mating with a variety of partners (Trivers, 1972). Therefore, it is less reproductively costly for men to perceive sexual interest when the person is not interested in sex (i.e., overperception bias) than fail to perceive sexual interest when the person is interested and miss a potential mating opportunity (i.e., underperception bias), a substantial loss for men in terms of reproductive success (Haselton & Buss, 2000). Numerous studies using multiple methods including videotaped interactions (Abbey, 1982; Shotland & Craig, 1988), written vignettes (Abbey & Harnish, 1995; DeSouza, Pierce, Zanelli, & Hutz, 1992), ratings of photographs (Edmondson & Conger, 1995; Maner et al., 2005), self-reports of past experiences (Haselton, 2003), and face-to-face interactions between strangers (Perilloux, Easton, & Buss, 2012) have demonstrated that men rate women as more sexually interested than the women themselves (or other female observers) report. All of the past studies, however, have been focused on perceptions of sexual interest in the context of initial encounters with potential partners and have not considered alternative relationship contexts. In the current set of studies, we test the prediction that in the context of ongoing intimate relationships, men will err on the side of the opposite bias and instead, underperceive their partner's desire.

Perceptions of Sexual Desire in Relationships

Over the past few decades, research on perceptual accuracy and bias in romantic relationships has grown substantially (for a review see Fletcher & Kerr, 2010; Fletcher, 2015). Overall this work suggests that romantic partners are fairly accurate in their judgments of each other, but that perceptual biases do exist and often serve the function of relationship maintenance (Fletcher, 2015). For example, when making judgments of positively valenced traits, positive directional bias (i.e., overperception) is common in romantic relationships. A wealth of previous research indicates that idealizing a romantic partner is associated with greater relationship quality and the maintenance of relationships over time (Miller, Niehuis, & Huston, 2006; Murray & Holmes, 1997; Murray, Holmes, & Griffin, 1996). Research on perceptions of sexuality in the context of romantic relationships, however, has been limited, and the current set of studies is the first to examine accuracy and bias in judgments of a romantic partner's sexual desire.

Although the sexual overperception bias is functional (at least for men) in the context of initial encounters (Haselton & Buss, 2000; Haselton & Galperin, 2013), previous research suggests that underperceiving a romantic partner's sexual desire may be func-

tional in the context of ongoing romantic relationships. Fletcher and Kerr (2010) find that although positive mean level bias (i.e., overperception) is commonplace in relationships and often serves to maintain positive illusions about the partner and the relationship, negative mean level bias (i.e., underperception) also occurs and can be functional in certain circumstances. In particular, when the judgment is of an interaction trait that is focused on the connection between the self and the partner (such as forgiveness, trust, or love), underperception may keep partners motivated to maintain the relationship (Fletcher & Kerr, 2010). That is, if a person overestimates their partner's forgiveness, trust, or love, this might lead to complacency and lack of effort in building a more secure relationship, but if a person underestimates interaction traits such as these, it might lead them to work harder to gain their partner's affection. Because sexual desire is an interaction trait that is focused on the connection between partners, overperceiving a partner's sexual desire could lead to complacency or a lack of trying to incite a partner's desire, which could be costly for relationship maintenance. Instead, underperceiving a partner's sexual desire in the context of a romantic relationship may motivate people to entice their partner's interest, which could be beneficial for relationship maintenance.

In addition to warding off complacency, underperceiving a partner's sexual desire may reduce the likelihood of initiating sex when a partner is not in the mood and in turn, minimize the risk of sexual rejection. Previous research on social rejection has shown that people report feeling the most emotional pain when rejected by a romantic partner compared to any other perpetrator (Leary, Springer, Negel, Ansell, & Evans, 1998). In the domain of sexuality specifically, one study showed that the more frequently men and women reported that they were sexually rejected by their partner in the previous week, the lower their self-reported sexual satisfaction (Byers & Heinlein, 1989). Another study showed that women who feel pressured to have sex by their romantic partner report relationship dissatisfaction and poor sexual functioning (Katz & Myhr, 2008). Taken together, these findings suggest that sexual rejection can detract from the quality of romantic relationships.

Risk regulation theory posits that people are motivated to think and behave in ways that minimize their vulnerability to rejection by their romantic partner in the short-term and maximize the possibility of maintaining their relationship over time (for a review see Murray, Derrick, Leder, & Holmes, 2008; Murray, Holmes, & Collins, 2006). According to this research, for romantic partners to optimize their sense of assurance that their partner will be responsive to their needs, they employ a risk regulation strategy where they shift between the goals of avoiding rejection and seeking out closeness, and this is based, at least in part, on their perceived risk of rejection in a given situation (Murray et al., 2006). These ideas are also echoed in findings from sociometer theory that suggest that assessing other's feelings about the self helps people to avoid rejection and maintain social relationships (Leary & Downs, 1995; Leary, Tambor, Terdal, & Downs, 1995). Therefore, applied to the current research, underperceiving a partner's sexual desire should be calibrated based on a person's motivation to avoid sexual rejection and functions to keep partners from becoming complacent about maintaining their relationship. As such, we would expect underperception to be associated with greater relationship

quality and would also expect a person to be more likely to underperceive their partner's sexual desire when they are highly motivated to avoid sexual rejection.

Gender

Research on men's overperception bias in the context of initial encounters indicates clear gender differences in sexual underperception, but should we expect gender differences in established relationships? Based on research showing that men tend to have greater sexual interest than women (Baumeister, Catanese, & Vohs, 2001) and that men are expected to "take the lead" during sexual encounters more so than women (Dworkin & O'Sullivan, 2005; Makalu, Todd, Milhausen, Lachowsky & Undergraduate Research Group in Sexuality, 2014; Vannier & O'Sullivan, 2011), we believe the answer to this question is yes. In a comprehensive review, Baumeister et al. (2001) concluded that—across a variety of markers or indicators of sexual desire—men tend to show more interest in sex than do women. For example, compared to women, men think about sex more often (Laumann, Gagnon, Michael, & Michaels, 1994) and report more frequent sex fantasies and feelings of desire (Leitenberg & Henning, 1995). Men tend to report higher sexual desire than women, and this may be particularly pronounced in established relationships. In a study of German university students in heterosexual relationships, Klusmann (2002) found that men were more likely than women to complain that their desired frequency of sex outpaced their actual sexual frequency, and this discrepancy grew larger with increased relationship length. In addition, when dating and marriage partners disagree about sexual frequency, men usually want to have sex more often than their female partners (McCabe, 1987; Smith et al., 2011).

Beyond differences in reported sexual desire, men may feel a greater sense of responsibility for the occurrence and quality of a sexual experience. Men face expectations of high sexual skill to a degree that is not true for women (Salisbury & Fisher, 2014; Seal & Ehrhardt, 2003) and are often expected to initiate and take the lead in sexual encounters (Dworkin & O'Sullivan, 2005; Sakaluk et al., 2014; Vannier & O'Sullivan, 2011). For example, discussions among men and women about gender roles in sexual activity are imbued with presumptions that men are responsible for both partners' pleasure, with women as passive recipients (Salisbury & Fisher, 2014). In fact, higher sexual desire, which men tend to report, is associated with greater sexual assertiveness (Santos-Iglesias, Sierra, & Vallejo-Medina, 2013). In addition, men's sexual desire may be more intrinsic or spontaneous, whereas women's desire tends to be more responsive to situational or relationship cues (Basson, 2001; Leiblum, 2002).

Given that men tend to report a desire to engage in sex more frequently than women and tend to take the lead in sexual encounters, men should require less enticement from their partner to engage in sex and instead, should be more motivated to attract their partner's sexual interest. That is, we expect that men will demonstrate a sexual underperception bias in the context of romantic relationship, but women will not, and that this sexual underperception bias will be more strongly associated with relationship quality and maintenance for men than women.

Testing Biases in Perceptions of Sexual Desire in Established Relationships

In the time since much of the research on men's sexual overperception bias has been conducted, there have been important advances in the modeling of accuracy and bias in human judgments. The Truth & Bias (T&B) model (West & Kenny, 2011) is a recently developed, cutting-edge statistical model that has advanced research in the area of perceptual biases by simultaneously estimating three independent effects: directional bias (i.e., how much a person overestimates or underestimates their partner's sexual desire), tracking accuracy (i.e., how much a perceiver accurately detects changes in their partner's sexual desire), and assumed similarity (i.e., how much a person projects their own desire in their perceptions of their partner's desire). Previous research has found that when making judgments about a partner in the context of romantic relationships, people can be simultaneously be both accurate *and* biased (Fletcher, 2015). For example, Jack might accurately perceive that his partner Jill is invested in their relationship, but at the same time, Jill may have made investments in the relationship that Jack does not perceive, such as telling others about the relationship or making plans to introduce him to her family, and he might underperceive her exact level of investment. Overall, Fletcher, and Kenny (2012) found that during conflict discussions, romantic partners both accurately tracked and underperceived their partner's positive regard. These previous findings highlight the important of simultaneously testing both accuracy and bias when aiming to understand partner perceptions in close relationships.

Our key predictions in the current research center around over and underperception bias, but we also assess accuracy and assumed similarity in the same model. Little is known from previous research, however, about how accurate romantic partners tend to be when making judgments about each other's sexual interest. In a study of perceptions of a partner's sexual satisfaction in the context of established relationships, Fallis, Rehman, and Purdon (2014) found that both men and women tended to be fairly accurate when estimating their partner's sexual satisfaction. That is, partner perceptions of sexual satisfaction were highly correlated with self-reports. Men did, however, slightly underperceive their partner's sexual satisfaction whereas women did not demonstrate an over- or underperception bias. In another study on romantic partners' preferences for duration of sex and foreplay, both men and women were also fairly accurate in estimating their partner's preferences and women, but not men, significantly underestimated their partner's preferred duration of sex and foreplay (Miller & Byers, 2004). These findings suggest that although men and women demonstrate a degree of accuracy in estimating their partner's sexual interests, they also show directional biases where they systematically over- or underperceive their partner's sexual preferences.

Another perceptual bias that is relevant in the context of ongoing relationships is the extent to which people project their own feelings onto to their partner when making judgments about their partner's sexual interest. For example, outside of the domain of sexuality, when making judgments about a partner's care and responsiveness, both men and women tend to project their own care and responsiveness onto their partners (i.e., assume similarity) as a strategy to maintain close relationships (Lemay & Clark,

2008; Lemay, Clark, & Feeney, 2007). In fact, previous research has found that in domains that are likely to be similar between partners, such as feelings of closeness or relationship satisfaction, assuming similarity with a partner is adaptive (Kenny & Acitelli, 2001; Schul & Vinokur, 2000). Therefore, it is likely that when perceiving a partner's interest in sex, people will assume some degree of similarity between their own desire and their partner's desire (i.e., they will project their own feelings of desire when making judgments of their partner's desire). Research with previously unacquainted dyads has demonstrated that both men and women project their own sexual interest when making judgments about the sexual interest of their interaction partner (Henningsen & Henningsen, 2010). Therefore, when testing our key predictions about directional bias (i.e., over- or underperceiving a partner's sexual desire) we also tested whether men and women were accurate in their perceptions of their partner's sexual desire and whether they assumed a degree of similarity between their desire and their partner's desire. Taking these other perceptual processes into account also provides a more complete picture of perceptual accuracy and bias in judgments of sexual desire in the context of romantic relationships.

In the current set of studies, we predicted that both men and women would demonstrate tracking accuracy and assumed similarity when perceiving their partner's sexual desire in the context of an established relationship, but our main goal was to test, after accounting for these effects, over- and underperception in the context of romantic relationships. We predict that in established intimate relationships men, but not women, will demonstrate an underperception bias where they perceive less sexual desire than their partner reports. We also predict that this underperception bias will be particularly functional for men in that it will help to maintain their relationships. Finally, this underperception bias should be strongest at times when people are motivated to avoid rejection and for people who report higher sexual desire.

The Current Studies

The current investigation provides the first empirical test of perceptions of sexual desire in established relationships. We conducted three dyadic studies (two of which were 21-day daily experience studies) in which both members of dating, cohabiting, and married couples provided reports of their own sexual desire and their perceptions of their partner's desire. Across all three studies, when testing for overperception or underperception biases, we also tested the extent to which people's perceptions of their partner's desire are associated with their partner's actual desire (i.e., tracking accuracy) as well as the extent to which they project their own desire onto their perceptions of the partner's desire (i.e., assumed similarity), consistent with recent modeling approaches to accuracy and bias in human judgments (West & Kenny, 2011). Although we expected people to demonstrate tracking accuracy and assumed similarity, our key prediction is that, in contrast to the sexual overperception bias found in the initial encounters (e.g., Haselton & Buss, 2000), in the context of established relationships, men will demonstrate an underperception bias. Based on previous research on perceptual biases in romantic relationships, underperceiving traits that involve an interaction between the partner and the self (i.e., sexual desire) is likely to be functional in that it helps to maintain relationships (Fletcher & Kerr, 2010). In the current

research we also test the consequences of over and underperceiving a partner's sexual desire to determine which is more beneficial for romantic relationship satisfaction and commitment.¹ Given that in the context of romantic relationships, sexual rejection can be particularly painful (Leary et al., 1998) and people aim to minimize their vulnerability to rejection from their romantic partner (Murray et al., 2006), we also expected that people would be particularly likely to underperceive their partner's desire on days when they are highly motivated to avoid sexual rejection compared to when their motivation to avoid sexual rejection is low. Finally, we also expected, consistent with previous research (e.g., Baumeister et al., 2001), that men would report higher general levels of sexual desire than women and that people with higher sexual desire would demonstrate a stronger underperception bias.

In sum, we expected that men would demonstrate a sexual underperception bias in the context of romantic relationships where they would underperceive their partner's sexual desire (tested across all three studies). We then expected that underperceiving a partner's sexual desire would be associated with men's partners reporting greater relationship satisfaction and commitment (tested across all three studies). Finally, we expected that men's underperception bias would be stronger on days when they were more motivated to avoid sexual rejection and would be stronger for people who reported high sexual desire in general (tested in Study 3).

Study 1

Method

Participants and procedure. Forty-four heterosexual couples were recruited from the Greater Toronto Area to participate in a 21-day daily experience study.² We are sufficiently powered to test our predictions at Level 1, where we have data from 1,560 daily reports. Participants ranged in age from 23 to 61 ($M = 36.0$, $SD = 8.7$), and had been in their current relationship from 3 to 39 years ($M = 11.1$, $SD = 8.8$); 68% of the couples were married, and 32% were cohabiting. Participants identified as White/Caucasian (82%), Asian (3.5%), Black (2%), Latin American (1%), Aboriginal (1%), and 10.5% identified as multiethnic or other.

After both partners agreed to take part in the study, the participants were e-mailed a link to the initial online survey. Both members of the couple were instructed to begin the study on the same day. On the first day, the couples completed a longer background survey, and then completed a 10-min survey each night for 21 consecutive days. Participants completed 1,560 diary entries for an average of 17.7 (of 21) entries per person. Each partner was paid \$40 CAD.

¹ The theoretical precision for the predictions about the consequences and functionality of perceptual biases and the gender differences in these consequences came into focus after data analysis.

² The data from Study 1 has also been published in Muise, Impett, and Desmarais (2013); Muise, Impett, Kogan, and Desmarais (2013); and Muise and Impett (2015). The current set of findings differs from the previous findings in that here we are testing accuracy and bias in judgments of a partner's sexual desire and the consequences of these judgments. Reports on perceptions of a partner's desire in the current study were not included in the previous papers.

Measures. To test our key predictions, each day for 21 consecutive days, participants responded to a one-item indicator of their own sexual desire (Impett, Strachman, Finkel, & Gable, 2008; Muise, Impett, Kogan, & Desmarais, 2013), "I felt a great deal of sexual desire for my partner today" ($M = 4.81$, $SD = 1.69$, range 1 to 7; $M = 4.65$, $SD = 1.71$, range 1 to 7; for men and women, respectively), and a one-item indicator of their partner's sexual desire, "I felt my partner had a great deal of sexual desire for me today" ($M = 4.30$, $SD = 1.72$, range = 1–7; $M = 4.79$, $SD = 1.69$, range = 1–7; for men and women, respectively).

To test the consequences of accuracy and bias for perceptions of a partner's sexual desire, we asked participants to report on their daily feelings of relationship satisfaction and commitment. Each day participants responded to three items about their relationship satisfaction ($M = 5.98$, $SD = 1.03$; $\alpha = .94$) and three items about commitment ($M = 6.31$, $SD = .95$; $\alpha = .94$) from the Rusbult, Martz, and Agnew (1998) scale.

In addition, to test alternative explanations for our findings, we asked participants to report on their sexual satisfaction and sexual frequency. Participants reported their overall feelings of sexual satisfaction in the relationship using the 25-item Index of Sexual Satisfaction (Hudson, Harrison, & Crosscup, 1981) rated on a 7-point scale (1 = *never to 7 = all the time*). Items assessed satisfaction with sexual aspects of a relationship ("I feel our sex life really adds a lot to our relationship"; $\alpha = .98$; $M = 4.04$, $SD = .77$). We also recorded the number of times couples engaged in sex over the course of the 21-day study. Participants reported engaging in sex an average of once per week over the 21-day study ($M = 3.34$, $SD = 2.33$, range = 1–10 days), a frequency that is in line with sexual frequency reported in previous research (Blanchflower & Oswald, 2004; Laumann et al., 1994).

Data analytic strategy. We used West and Kenny's (2011) Truth and Bias (T&B) model to test the degree to which people are accurate and biased in their judgments of their romantic partner's sexual desire. In this model, the person making the judgment is called the *perceiver*; the perceiver's judgments are compared with their *partner's* actual ratings. Our data have a nested structure, with both partners' ratings of sexual desire and perceptions of their partner's sexual desire across the 21 days (Level 1) nested within dyad (Level 2). As specified by West and Kenny (2011), the perceiver's judgments of their partners' daily sexual desire (the outcome variable) were centered on the partner's actual reported sexual desire by subtracting the grand mean of partners' sexual desire (i.e., mean across dyads) from the perceiver's judgments of their partner's sexual desire on each day (see also Overall et al., 2012). This centering strategy means that the intercept represents the difference between the average of the partners' sexual desire and the average of the perceivers' judgments of their partner's desire. Therefore, the average of this coefficient across perceivers tests whether perceivers' judgments differed from the partners' actual desire across the daily experience study and specifies the direction of that bias. This is referred to in the T&B Model as *directional bias* (West & Kenny, 2011). A negative intercept indicates that the perceiver underestimated their partner's desire, whereas a positive intercept indicates that the perceiver overestimated their partner's desire.

In addition to estimating directional bias in the T&B model, we extend previous work on sexual perception by also obtaining estimates of tracking accuracy (i.e., the extent to which perceivers

draw on their partner's actual desire in their judgments of their partner's desire) and assumed similarity (i.e., the extent to which perceivers project their own desire onto their partner when making their judgments). To assess accuracy, one of the predictor variables in the model is the partner's actual sexual desire, which was grand-mean centered across dyads and time points. Its coefficient assesses *tracking accuracy*—the degree to which perceivers' judgments correctly mapped onto their partners' actual sexual desire. A positive coefficient indicates that perceivers were accurately tracking the degree to which the partners' sexual desire varied across the 21-day study. Finally, to assess the extent to which participants project their own desire when making judgments about a partner's sexual desire, the other predictor variable in the model is the perceiver's own sexual desire, which was also grand-mean centered across dyads and time points. Its coefficient assesses *assumed similarity*—the degree to which perceivers' judgments are influenced by their own feelings of desire. A positive coefficient indicates that perceivers are projecting their own desire when making judgments about their partner's desire.

All analyses were conducted using the MIXED procedure in SPSS 20.0 with separate intercepts for men and women. Then, to determine whether there were any significant gender differences in the directional bias, tracking accuracy or assumed similarity, we estimated a pooled model across men and women and tested for gender moderations (see Kenny, Kashy, & Cook, 2006; Overall et al., 2012). A significant gender moderation in the pooled model would indicate that an effect is significantly different for men and women. In both models, error variances were allowed to vary for men and women. Additionally, directional bias, tracking accuracy, and assumed similarity were entered as random effects, and error variances were allowed to differ by gender (see Overall et al., 2012; West & Kenny, 2011).

Next, we conducted analyses to test the consequences of accuracy and bias in perceptions of sexual desire. To do this, we conducted multilevel polynomial regression with response surface analyses (RSA; Edwards & Parry, 1993) following the guidelines of Shanock, Baran, Gentry, Pattison, and Heggstad (2010). These analyses allowed us to test how the degree of agreement between partners (i.e., accuracy) and how the direction of disagreement (i.e., over- or underperception) is associated with relationship satisfaction and commitment. We conducted the analyses using a two-level cross model with separate intercepts for men and women. As per the guidelines in Shanock et al. (2010), we centered the variables (i.e., the scores for perceptions of a partner's desire and the partner's report of their actual desire) around the midpoint of the scale. Next we created squared versions of these variables and a product term (perceptions of partner's desire \times partner's actual desire) and entered all five variables as predictors (see Table 2). We then evaluated the results with regard to four surface test values (a_1 , a_2 , a_3 , and a_4). To do this, we entered the five coefficients obtained from the MLM analyses and their respective standard errors into an excel spreadsheet from Shanock et al. (2010) to test the significance of the surface values. Our primary interest in the current research is how the degree of agreement between a person's perceptions of their partner's sexual desire and their partner's actual desire (a_1 ; line of perfect agreement) and how the direction of disagreement (a_3 ; line of disagreement) are associated with relationship satisfaction and commitment, but we report all values from these analyses in Table

2. A significant positive value for a_1 , the slope of the line of perfect agreement indicates that when perceptions of a partner's desire and a partner's actual desire increase together, relationship satisfaction and commitment increase, and a significant negative value for a_1 indicates that as perceptions of a partner's desire and a partner's actual desire increase together, relationship satisfaction and commitment decrease. For a_3 , the slope of the line of disagreement, positive values indicate that overperception is associated with greater satisfaction and commitment compared to underperception, whereas negative scores for a_3 indicate that underperception is associated with greater satisfaction and commitment than overperception. Finally, we used the R package *RSAPlots* to graph the surface plots.

Results

The results for directional bias, tracking accuracy, and assumed similarity for men and women are displayed in Table 1. We found that both men and women displayed significant tracking accuracy (i.e., they drew on their partner's actual desire in their perceptions) and assumed similarity between their own desire and their partner's desire (i.e., they projected their own feelings of desire onto their partner). There were no significant gender differences in these effects, suggesting that men and women do not differ in the extent to which they draw on their partner's actual desire and their own desire in making judgments of their partner's desire. In the same model, we tested our key prediction that men underperceive their romantic partner's sexual desire. As shown in Table 1, these results revealed that men did, in fact, significantly underperceive their partner's sexual desire, whereas women did not significantly over- or underperceive their partner's sexual desire. To examine whether there was a significant gender difference in the directional bias, we tested gender moderations in the pooled model (men = -1, women = 1). The results of this analysis indicated that the gender difference in directional bias was significant; that

is, men significantly underperceived their partner's sexual desire compared to women.

The consequences of accuracy and bias in perceptions of sexual desire. The next set of analyses tested the consequences of agreement and disagreement between perceptions of a partner's sexual desire and the partner's actual desire. Table 2 and Figures 1 and 2 display the results for men and women. The pattern of results were similar for relationship satisfaction and commitment, therefore we only graphed the results for relationship satisfaction. First, we tested the consequences of agreement (i.e., accuracy) for relationship satisfaction and commitment. To do this, we examined the direction and significance of the a_1 values, or the line of perfect agreement. As depicted in Figures 1 and 2, the results indicate that, for both men and women, accurately detecting that their partner has high desire for sex is associated with both partners feeling more satisfied and committed in the relationship.

Next, we tested our key predictions about the consequences of over- or underperception bias in perceptions of a partner's sexual desire. To do this, we examined a_3 , the line of disagreement. As depicted in Figure 1, we found that, for both men and women, overperceiving a partner's sexual desire, compared with underperceiving, was associated with feeling more satisfied and committed in the relationship. In line with our predictions, however, and as depicted in Figure 2, we also found that underperceiving, compared to overperceiving, was associated with men's partners feeling more satisfied and committed in their relationship. In other words, on days when men underperceived, as opposed to overperceived, their partner's sexual desire, their partner reported greater relationship satisfaction and commitment. When women underperceived, compared with overperceived, their partners also report greater relationship satisfaction (see Figure 2), but not greater commitment.

Testing alternative explanations and generalizability. Next, to bolster our confidence in our findings, we conducted additional analyses to test alternative explanations for our findings. First we tested the possibility that sexual satisfaction and sexual frequency would influence perceptual biases. It is possible that people with less satisfying sex lives might be particularly "tuned out" to their partner's needs and underperceive their desire. None of the reported effects, however, were moderated by sexual satisfaction suggesting that both men who are higher and lower in sexual satisfaction are demonstrating an underperception bias. Finally, we also tested whether perceptual biases would differ on days when couples had sex or based on the number of sexual experiences couples engaged in over the course of the diary. It is possible that if couples are having less frequent sex (perhaps because a partner is generally not interested in sex) that men's underperception bias would be stronger. However, the effects were not moderated by the frequency with which couples engaged in sex over the course of the daily experience study or by whether they engaged in sex on a particular day. We believe that these additional results provide evidence that these perceptual biases are not contingent on sexual activity or how participants feel about their sex lives in general; men tend to underperceive a partner's desire regardless of their overall sexual satisfaction and frequency.

Table 1

Gender Differences in Directional Bias, Tracking Accuracy, and Assumed Similarity in Judgments of the Partner's Sexual Desire Across the Diary Period in Study 1

Judgments of partner's sexual desire	<i>b</i>	<i>SE</i>	<i>t</i>	95% CI	Effect size <i>r</i>
Directional bias					
Men	-.41	.11	-3.85***	-.63, -.19	.53
Women	.09	.09	1.01	-.10, .28	.16
Gender difference	.22	.08	2.70**	.06, .39	.39
Tracking accuracy					
Men	.21	.04	5.03***	.13, .30	.64
Women	.16	.04	3.77***	.08, .25	.53
Gender difference	-.02	.03	-.92	-.07, .03	.14
Assumed similarity					
Men	.66	.06	11.78***	.55, .78	.90
Women	.65	.04	15.20***	.56, .73	.92
Gender difference	-.02	.03	-.76	-.08, .04	.14

Note. In the model testing gender differences, men were coded as -1 and women were coded as 1. Approximate effect sizes were calculated using the formula $r = \sqrt{t^2/(t^2 + df)}$ (see Overall & Hammond, 2013; Rosenthal & Rosnow, 2007). Degrees of freedom for effects ranged from 29.74 to 42.04.

** $p < .01$. *** $p < .001$.

Study 2

Study 1 provided the first empirical test of accuracy and bias in perceptions of sexual desire in romantic relationships. In Study 2,

Table 2
Testing the Consequences of Accuracy and Perceptual Bias by Gender Using Multilevel Polynomial Regression With Response Surface Analyses in Study 1

Gender	Multilevel polynomial regression coefficients						Surface values			
	b ₀	b ₁ P	b ₂ D	b ₃ P ²	b ₄ D×P	b ₅ D ²	a ₁	a ₂	a ₃	a ₄
Men										
Own rel sat	5.89 (.11)***	.24 (.02)***	.06 (.02)*	-.04 (.01)**	.02 (.01)	-.02 (.01)	.30***	-.04	.19***	-.07**
Own comm	6.15 (.15)***	.13 (.02)***	.01 (.02)	-.04 (.01)***	.01 (.01)	.01 (.01)	.13***	.02	.11***	.00
Par rel sat	5.91 (.11)***	.07 (.02)**	.24 (.02)***	-.02 (.01)	.02 (.02)	-.02 (.01)	.31***	-.02	-.17***	-.06**
Par comm	6.50 (.08)***	.002 (.02)	.15 (.02)	.01 (.01)	-.01 (.01)	-.03 (.01)*	.15***	-.02	-.15***	-.01
Women										
Own rel sat	5.79 (.11)***	.24 (.03)***	.09 (.03)**	.002 (.01)	-.03 (.02)	-.00 (.02)	.30***	-.02	.17***	.03
Own comm	6.28 (.08)***	.13 (.02)***	.05 (.02)*	-.002 (.01)	-.002 (.01)	-.01 (.01)	.18***	-.01	.08**	-.01
Par rel sat	5.65 (.11)***	.06 (.03)*	.28 (.03)***	.002 (.01)	.01 (.02)	-.03 (.01)*	.34***	-.03	-.22***	-.04
Par comm	6.20 (.14)***	.05 (.02)**	.10 (.02)***	-.01 (.01)	-.02 (.01)	-.01 (.01)	.15***	-.03	-.05	.01

Note. P = perceptions of partner's desire; D = partner's actual desire; standard errors in brackets. The first key value of interest is a₁, the line of perfect agreement, where a significant positive value indicates that when perceptions of and partner's actual desire are in agreement and increase, relationship satisfaction/commitment increase. A significant negative value for a₁ indicates that when perceptions of and a partner's actual desire are in agreement and increase, relationship satisfaction/commitment decrease. The second key value of interest is a₃, the line of disagreement, where a positive value indicates that overperception is better than underperception for relationship satisfaction/commitment and a negative value for a₃ indicates that underperception is better than overperception for relationship satisfaction/commitment.

* $p < .05$. ** $p < .01$. *** $p < .001$.

we sought to replicate the effects of Study 1 in a larger, independent sample of couples. We predicted that, as in Study 1, men would demonstrate an underperception, whereas women would not. As in Study 1, we also tested the consequences of perceptual biases (over and underperception) for both perceivers and partners' relationship satisfaction and commitment, to test the prediction that the sexual underperception bias would be particularly functional for men.

Method

Participants and procedure. The sample included 84 romantic couples (80 mixed-sex, 4 same-sex); recruited from the University of Western Ontario and surrounding London, Ontario community.³ We conducted the analyses with and without the same-sex couples and the pattern of results remained the same, so all couples are included in the analyses. To be eligible for the study, partners had to be at least 18 years of age and currently involved in a romantic relationship for at least 1 month. They also needed to be able to attend a lab session together to complete the study. Participants received \$15.00 CAD each (\$30.00 CAD per couple) to complete the study. Participants ranged in age from 18 to 68 years of age ($M = 23.64$ years, $SD = 8.21$ years) and were involved in relationships lasting 1 month to 38 years ($M = 2.83$ years, $SD = 5.33$ years). Approximately 83% of participants reported dating their partner casually or exclusively, and 17% reported being common-law, engaged, or married. A minority of participants (36%) indicated that they were cohabiting with their romantic partner.

Partners arrived at the lab together and were greeted by a research assistant. Each participant was then escorted to a private room where they separately completed the study. Questionnaires were completed online and participants were allowed to skip any questions they wished. Participants first completed a general background questionnaire in which they reported on a number of demographic variables and then responded to a series of questions

about their own sexual desire and relationship satisfaction, as well as their perceptions of their partner's sexual desire.

Measures. To test our key predictions, participants responded to a one-item indicator of their own sexual desire (adapted from Impett et al., 2008; Muise et al., 2013), "I feel a great deal of sexual desire for my partner" (range = 1–7; $M = 6.06$, $SD = 1.11$; $M = 5.86$, $SD = 1.48$ for men and women, respectively), and a one-item indicator of their partner's sexual desire, "I feel my partner had a great deal of sexual desire for me" (range = 1–7; $M = 5.75$, $SD = 1.37$; $M = 6.11$, $SD = 1.38$ for men and women, respectively). Participants also reported their relationship satisfaction using the Relationship Assessment Scale (Hendrick, 1988), a seven-item measure rated on a 5-point scale (1 = *not at all/extremely poor*, 5 = *a great deal/extremely good*) that assessed how happy individuals are in their current romantic relationship (e.g., "How good is your relationship compared to most?"). Responses were averaged across the seven items such that higher scores indicated greater relationship satisfaction ($M = 4.29$, $SD = .59$, $\alpha = .86$). Finally, participants completed the commitment subscale of the Investment Model Scale (Rusbult, Martz, & Agnew, 1998), a seven-item measure rated on a 9-point scale (0 = *do not agree at all*, 8 = *agree completely*) that taps the extent to which individuals are dedicated to their romantic relationship (e.g., "I want our relationship to last for a very long time."). Commitment scores were computed by averaging responses across the seven items, with higher scores indicating greater commitment ($M = 6.85$, $SD = 1.49$, $\alpha = .89$).

Finally, to test for alternative explanations participants reported their sexual satisfaction and sexual frequency. To assess their

³ Study 2 was preregistered on the Open Science Framework. The Study 2 measures and data reported were taken from a larger empirical investigation that is preregistered at osf.io/zbjre; the study measures, a priori hypotheses, syntax files, and data of Study 2 in particular are preregistered and available at osf.io/qnk92.

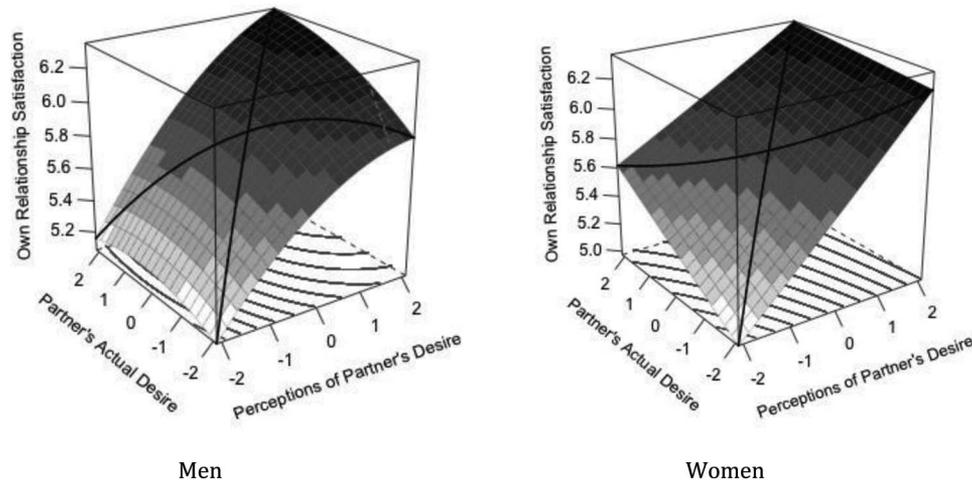


Figure 1. Response surface plots for the effect of perceptions of a partner's desire and a partner's actual desire on a person's own relationship satisfaction by gender (Study 1).

general feelings of sexual satisfaction, participants responded to the five-item Global Measure of Sexual Satisfaction (GMSEX; Lawrence & Byers, 1995) using 7-point bipolar scales: *bad–good*, *unpleasant–pleasant*, *negative–positive*, *unsatisfying–satisfying*, *worthless–valuable* ($M = 6.08$, $SD = 1.21$, $\alpha = .95$). To assess their general sexual frequency, participants responded to the item “In one month, how often do you and your partner engage in sexual activity (e.g., intercourse, heavy petting, oral sex etc.)?” on a scale from 1 (*never*) to 9 (*more than 13 times*) ($M = 5.95$, $SD = 2.62$).

Data analytic strategy. As in Study 1, we used West and Kenny's (2011) Truth and Bias (T&B) model to test the degree to which people are accurate and biased in their judgments of their romantic partner's sexual desire. All variables were created as in Study 1. All analyses were conducted using the MIXED procedure in SPSS 22.0, and we tested a two-level model where persons were nested within couples. As in Study 1, we first tested the effects separately for men and women. Then, to determine whether there

were any significant gender differences in the directional bias, tracking accuracy or assumed similarity, we estimated a pooled model across men and women and tested for gender moderations (see Kenny et al., 2006; Overall et al., 2012). A significant gender moderation in the pooled model would indicate that an effect is significantly different for men and women.

As in Study 2, we also tested the consequences of accurate and bias perceptions of a partner's sexual desire using multilevel polynomial regression with RSA (Shanock et al., 2010). First we ran a two-level model with separate intercepts for men and women to obtain the polynomial regression coefficients. We then used these values to calculate the surface tests using the excel spreadsheet from Shanock et al. (2010). As in Study 1, our interest is in the values for a_1 and a_3 . Positive values for a_1 , the line of perfect agreement, indicate that when perceptions of partner's desire and a partner's actual desire are in agreement and increase, so do the outcomes, whereas negative values for a_1 suggest that the out-

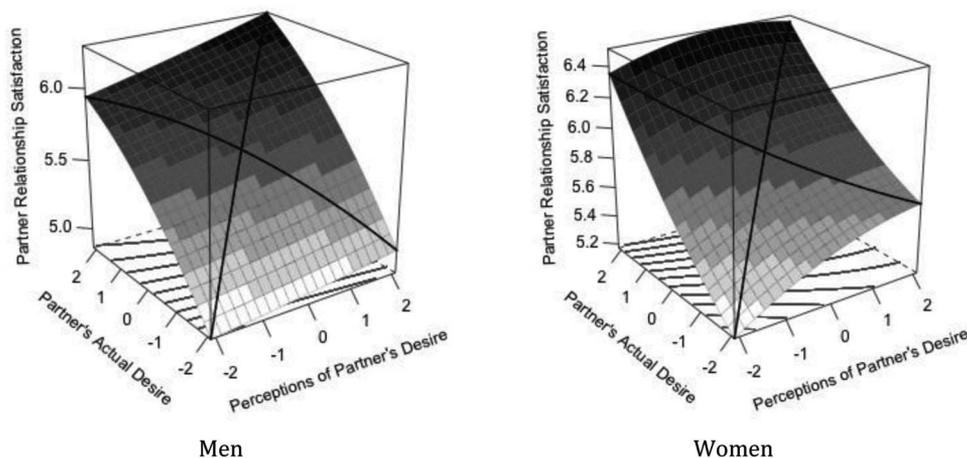


Figure 2. Response surface plots for the effect of perceptions of a partner's desire and a partner's actual desire on a partner's relationship satisfaction by gender (Study 1).

comes decrease. For a_3 , the line of disagreement, positive scores indicate that overperception is associated with greater satisfaction and commitment than underperception, and negative scores indicate that underperception is associated with greater satisfaction and commitment than overperception. We used the R package *RSAPlots* to graph the results for relationship satisfaction.

Results

The results for directional bias, tracking accuracy, and assumed similarity for men and women are displayed in *Table 3*. In Study 2, men demonstrated significant accuracy (i.e., they drew on their partner's actual desire in their perceptions), whereas women did not. There was not a significant gender difference in this effect, however, suggesting that men are not significantly more accurate than women. Both men and women assumed similarity between their own desire and their partner's desire (i.e., they projected their own feelings of desire onto their partner), and there were no gender differences in this effect. In the same model, we tested our key prediction that men underperceive their romantic partner's sexual desire. As shown in *Table 3* and consistent with Study 1, these results revealed that men did, in fact, significantly underperceive their partner's sexual desire, whereas women did not significantly over- or underperceive their partner's sexual desire. To examine whether there was a significant gender difference in the directional bias, we tested gender moderations in the pooled model (men = -1, women = 1). The results of this analysis indicated that the gender difference in directional bias was significant; that is, men significantly underperceived their partner's sexual desire compared with women.

The consequences of accuracy and bias in perceptions of sexual desire. The next set of analyses tested the consequences of agreement and disagreement between perceptions of a partner's sexual desire and the partner's actual desire. *Table 4* displays the results of the multilevel polynomial regression with RSA for men

and women. First, we tested the consequences of agreement (i.e., accuracy) for relationship satisfaction and commitment. To do this, we examined the direction and significance of the a_1 values, or the line of perfect agreement. As depicted in *Figure 3*, the results suggest that, for men, when perceptions of a partner's desire and a partner's actual desire are in agreement and increase, their own relationship satisfaction and their partner's relationship satisfaction and commitment increase. This suggests that, for men, accurately perceiving their partner's high desire is associated with both partners' feeling more satisfied and committed. The line of agreement was not significant for women, however, suggesting that when women accurately perceived their partner's desire this is not associated with more or less satisfaction and commitment. Next we tested the consequences of disagreement (i.e., discrepancy between perceptions of a partner's desire and partner's reports of their actual desire) for relationship satisfaction and commitment. To do this, we examined the direction and significance of the a_3 values, or the line of disagreement. The line of disagreement was not significant for men's or women's own feelings of satisfaction and commitment. But, as depicted in *Figure 4*, the results indicate that for men, underperceiving their partner's desire (relative to overperceiving) is associated with greater satisfaction and commitment as reported by their romantic partners. Therefore, for men, underperceiving is beneficial in that it is associated with their partner feeling more satisfied and committed to the relationship. The line of disagreement was not significant for women's partners' feelings about the relationship, suggesting that neither over- or underperception was associated with satisfaction or commitment as reported by women's partners (see *Figure 4*).

Testing alternative explanations. In the final set of analyses, we tested whether the findings differed based on participants' reported sexual frequency and satisfaction. It is possible that the underperception bias is strongest among people who generally engage in sex less frequently or feel less satisfied with their sex lives. In fact, in this study, which is not consistent with Study 1, sexual satisfaction (men: $b = .62$, $SE = .15$, $t[121.03] = 4.13$, $p < .001$; women: $b = .84$, $SE = .19$, $t[137.57] = 4.56$, $p < .001$) and sexual frequency (men: $b = .14$, $SE = .04$, $t[49.35] = 3.19$, $p = .002$; women: $b = .18$, $SE = .06$, $t[81.85] = 2.89$, $p = .005$) significantly moderated the directional bias for both men and women. For participants who reported low sexual frequency (1 *SD* below the mean), men significantly underperceived their partner's desire ($b = -.65$, $SE = .16$, $t(50.90) = -4.07$, $p < .001$), whereas women did not demonstrate an underperception bias ($b = -.19$, $SE = .20$, $t[80.06] = -.99$, $p < .33$). For participants who reported high sexual frequency (1 *SD* above the mean), men did not demonstrate a significant directional bias ($b = .08$, $SE = .16$, $t[47.97] = .52$, $p < .61$) and women significantly overperceived their partner's desire ($b = .75$, $SE = .25$, $t[69.56] = 2.98$, $p = .004$). For participants low in sexual satisfaction (1 *SD* below the mean), both men and women significantly underperceived their partner's desire (men: $b = -1.05$, $SE = .24$, $t[115.59] = -4.48$, $p < .001$; women: $b = -.89$, $SE = .29$, $t[127.77] = -3.05$, $p = .003$), whereas men and women high in sexual satisfaction significantly overperceived their partner's desire (men: $b = .44$, $SE = .21$, $t[89.45] = 2.08$, $p = .04$; women: $b = .115$, $SE = .25$, $t[131.89] = 4.69$, $p < .001$). In terms of our key findings about men's underperception bias, it seems that this bias is particularly

Table 3

Gender Differences in Directional Bias, Tracking Accuracy, and Assumed Similarity in Judgments of the Partner's Sexual Desire Across the Diary Period in Study 2

Judgments of partner's sexual desire	<i>b</i>	<i>SE</i>	<i>t</i>	95% CI	Effect size <i>r</i>
Directional bias					
Men	-.27	.11	-2.41*	-.49, -.05	.26
Women	.18	.14	1.20	-.11, .44	.15
Gender difference	.21	.09	2.30*	.03, .39	.25
Tracking accuracy					
Men	.31	.09	3.50**	.13, .50	.61
Women	.11	.14	.74	-.19, .40	.14
Gender difference	-.11	.08	-1.30	-.27, .06	.14
Assumed similarity					
Men	.39	.12	3.16**	.14, .63	.37
Women	.37	.12	2.95**	.12, .62	.38
Gender difference	-.02	.08	-.23	-.19, .15	.03

Note. In the model testing gender differences, men were coded as -1 and women were coded as 1. Approximate effect sizes were calculated using the formula $r = \sqrt{t^2/(t^2 + df)}$ (see Overall & Hammond, 2013; Rosenthal & Rosnow, 2007). Degrees of freedom for effects ranged from 20.70 to 88.73.

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

Table 4

Testing the Consequences of Accuracy and Perceptual Bias by Gender Using Multilevel Polynomial Regression With Response Surface Analyses in Study 2

Gender	Multilevel polynomial regression coefficients						Surface values			
	b ₀	b ₁ P	b ₂ D	b ₃ P ²	b ₄ D×P	b ₅ D ²	a ₁	a ₂	a ₃	a ₄
Men										
Own rel sat	3.96 (.17)***	.13 (.10)	.07 (.07)	-.01 (.03)	.01 (.04)	-.04 (.03)	.29*	-.08	.01	-.08
Own comm	6.93 (.38)***	.09 (.21)	-.26 (.15)	.04 (.07)	-.05 (.08)	-.01 (.07)	.03	-.07	.08	-.02
Par rel sat	3.99 (.18)***	-.02 (.10)	.31 (.07)***	.004 (.03)	-.01 (.04)	-.06 (.03)	.27*	-.06	-.39**	-.08
Par comm	6.22 (.41)***	-.11 (.24)	.67 (.17)***	-.03 (.08)	-.01 (.09)	-.08 (.08)	.57*	-.12	-.78*	-.11
Women										
Own rel sat	4.19 (.27)***	.19 (.13)	-.02 (.15)	-.04 (.03)	.004 (.06)	-.03 (.05)	.24	-.08	.24	-.07
Own comm	6.63 (.61)***	.51 (.27)	.18 (.33)	-.10 (.07)	.05 (.12)	-.19 (.10)	.68	-.23	.38	-.26
Par rel sat	4.20 (.28)***	-.08 (.14)	-.16 (.15)	-.01 (.04)	.08 (.06)	.03 (.05)	-.25	.15*	.11	-.06
Par comm	6.62 (.66)***	-.31 (.31)	-.19 (.38)	.06 (.08)	.06 (.14)	.08 (.11)	-.50	.20	-.13	.08

Note. P = perceptions of partner's desire; D = partner's actual desire; standard errors in brackets. The first key value of interest is a₁, the line of perfect agreement, where a significant positive value indicates that when perceptions of and partner's actual desire are in agreement and increase, relationship satisfaction/commitment increase. A significant negative value for a₁ indicates that when perceptions of and a partner's actual desire are in agreement and increase, relationship satisfaction/commitment decrease. The second key value of interest is a₃, the line of disagreement, where a positive value indicates that overperception is better than underperception for relationship satisfaction/commitment and a negative value for a₃ indicates that underperception is better than overperception for relationship satisfaction/commitment.

* $p < .05$. ** $p < .01$. *** $p < .001$.

strong in men who report lower sexual frequency and feel less sexually satisfied in their relationships.

Study 3

In Studies 1 and 2, we found that men demonstrate an underperception bias in established relationships and find evidence suggesting that this underperception bias is functional for men in relationships in that underperceiving a partner's sexual desire is associated with men's romantic partners feeling more satisfied with and committed to the relationship. In Study 3, we sought to replicate and extend these effects. First, we test whether we replicate the findings from the previous two studies showing men's underperception bias in the context of romantic relationships, and that this underperception bias is associated with their partners feeling more satisfied and committed. Next, our predictions are grounded in risk regulation theory in romantic relationships suggesting that a person's thoughts and actions in a relationship should be based, in part, on the extent to which their goal is to avoid rejection (Murray et al., 2006). Therefore, in Study 3 we test the prediction that the sexual underperception bias should be strongest on days when people are highly motivated to avoid sexual rejection. Finally, we test the possibility that sexual desire is one individual difference variable that, at least partially, explains the gender difference in the sexual underperception bias in relationships. That is, we expect that men will report higher general levels of sexual desire (as reported at background) and that desire will moderate the directional bias, such that reporting higher desire is associated with a stronger underperception bias.

Method

Participants and procedure. Participants were recruited through online postings and classroom visits at a small Canadian university and through online postings on the websites Kijiji and Craigslist in the Greater Toronto Area as part of a larger study on

sexuality in romantic relationships (Day, Muise, Joel, & Impett, 2015).⁴ To be eligible to participate, both members of the couple had to agree to take part in the study and be over the age of 18. Eligible couples also had to see their partner several times a week and be sexually active. Interested participants who met the eligibility criteria emailed the researchers for more information about the study. After couples agreed to participate, each partner was e-mailed a unique link allowing them to access the online surveys.

A total of 101 couples (95 mixed-sex, 6 same-sex) ranging in age from 18 to 53 years ($M = 26$ years, $SD = 7$ years) participated in the study. We conducted the analyses without same-sex couples and the pattern of results was the same; therefore all couples are included in the analyses reported below. Again, our sample size exceeds multilevel power recommendations of sampling at least 50 observations at Level 2 (current study: 202 observations; Maas & Hox, 2005) and all of our predictions are at Level 1, which includes 3,320 daily reports. Nearly half the participants were cohabiting (29%), married (17%), or engaged (3%); the remaining participants were in a committed relationship, but not living together. Participants reported being involved their current relationship between 6 months and 22 years ($M = 4.45$ years, $SD = 3.76$ years) and identified as a diverse variety of ethnic backgrounds; 67% were White, 8% were Asian, 7% were Black, 4% were South Asian, 4% were Latin American, 4% were South East Asian, 1% were Arab/West Asian, and 5% identified as multiethnic or "other."

On the first day of the study, participants completed a 30-min background survey. Then, each day for 21 consecutive days, participants completed a 5- to 10-min daily survey. Participants

⁴ The current set of findings differs from the previous findings in that, in the current study we are testing accuracy and bias in judgments of a partner's sexual desire, which was not the focus of the previous study. Reports of desire, perceptions of a partner's desire, and motivation to avoid rejection in the current study were not used in the previous study.

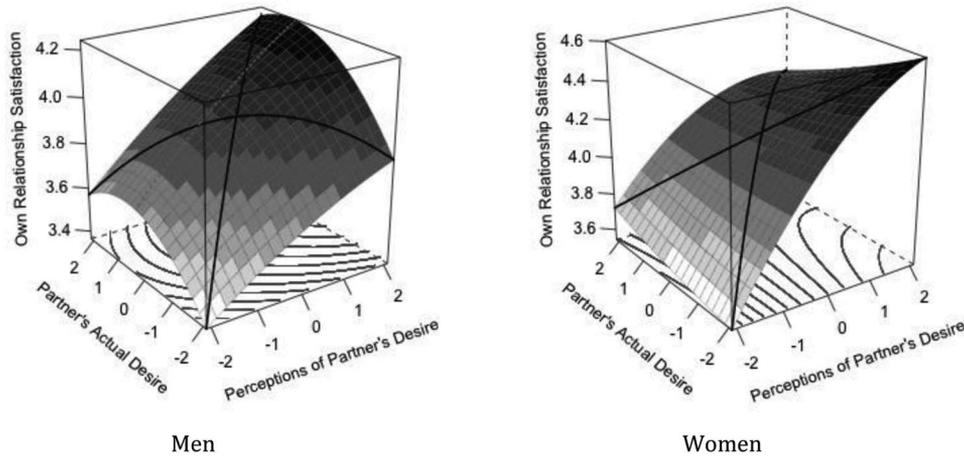


Figure 3. Response surface plots for the effect of perceptions of a partner's desire and a partner's actual desire on a person's own relationship satisfaction by gender (Study 2).

were asked to begin the study on the same day as their romantic partner and to refrain from discussing their responses with their partner until the completion of the study. Each participant was paid up to \$40 CAD (in gift cards) for completing the background and daily surveys; payment was prorated based on the number of daily diaries completed. Participants completed an average of 18 (of 21) daily surveys ($M = 18.48$, $SD = 5.06$, range = 1–21).

Measures. Each day, participants answered questions about their own sexual desire ($M = 4.96$, $SD = 1.84$, range = 1–7; $M = 4.53$, $SD = 2.00$, range = 1–7; for men and women, respectively) and their perceptions of their partner's sexual desire ($M = 4.54$, $SD = 1.96$, range = 1–7; $M = 4.50$, $SD = 2.01$, range = 1–7; for men and women, respectively) on a 7-point scale (1 = *not at all* to 7 = *very much*) with the same measures used in Study 1. Daily relationship satisfaction was assessed with two items adapted for the daily context from the Investment Model scale (Rusbult et al., 1998) rated on a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*; $M = 5.67$, $SD = 1.27$). Daily commitment was also assessed with two items adapted for the daily context from the

Investment Model scale (Rusbult et al., 1998; $M = 6.03$, $SD = 1.25$). To measure motivation to avoid rejection, each day participants rated their motivations for not wanting to pursue sex with their partner. Specifically, when asked about their motivations for not pursuing sex with their partner, they were asked one item about the extent to which they were motivated to avoid sexual rejection: "I did not want my partner to reject me" (1 = *not at all important* to 7 = *extremely important*). Men ($M = 2.18$) and women ($M = 2.47$) did not significantly differ in their motivation to avoid rejection and both used the full range of the scale and reported similar standard deviations ($SD = 1.79$ for men and $SD = 2.01$ for women). At background, participants also reported their general level of sexual desire using four items from the Hurlbert Index of Sexual Desire (Apt & Hurlbert, 1992; $\alpha = .92$, $M = 5.70$, $SD = 1.31$) rated on a 7-point scale (1 = *not at all* to 7 = *very much*).

In addition, to rule out alternative explanations for our findings participants reported more detailed information about the sexual experiences that occurred over the course of the 21-day study. To assess their general feelings of sexual satisfaction, participants

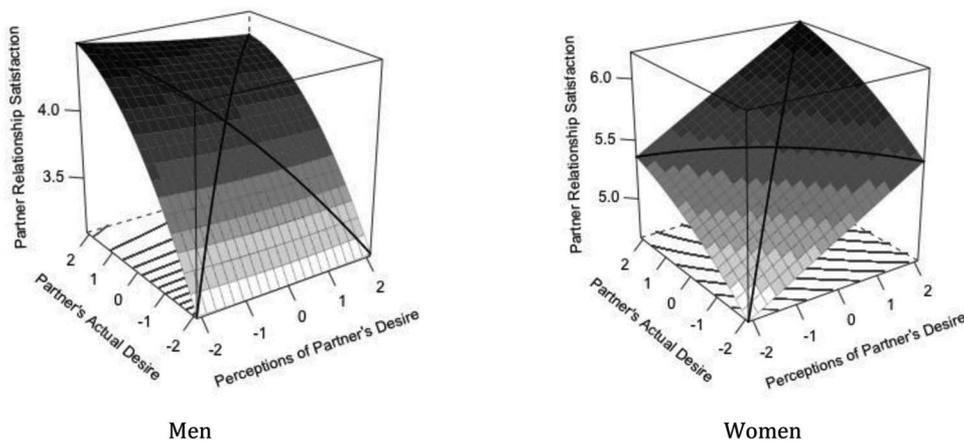


Figure 4. Response surface plots for the effect of perceptions of a partner's desire and a partner's actual desire on a partner's relationship satisfaction by gender (Study 2).

responded to the five-item Global Measure of Sexual Satisfaction (GMSEX; Lawrance & Byers, 1995) using 7-point bipolar scales: *bad–good, unpleasant–pleasant, negative–positive, unsatisfying–satisfying, worthless–valuable* ($M = 5.92, SD = 1.11, \alpha = .92$). Each day, we also asked participants whether or not sex was initiated (sex was initiated on 34% of days), and whether or not they actually engaged in sex ($M = 4.13$ days over the 21-day study, $SD = 2.83, \text{range} = 1\text{--}14$).

Data analytic strategy. As in Studies 1 and 2, West and Kenny's (2011) T&B model guided our analyses. We created all variables in the same way as Studies 1 and 2. In this Study we also tested for moderation by daily sexual rejection. The daily sexual rejection variable was person-mean centered (centered around each person's own mean), to test whether the directional bias differed on days when a person was more versus less motivated to avoid sexual rejection (Raudenbush, Bryk, Cheong, & Congdon, 2004). To test whether directional bias in perceptions of a partner's desire can be attributed to the motivation to avoid rejection, we entered a person's daily motivation to avoid sexual rejection as a predictor of the mean-level bias (i.e., the intercept).

In a separate analysis, we tested whether sexual desire as measured at background moderated the directional bias. The background sexual desire variable was grand-mean centered and cross-level interactions were tested since sexual desire is a Level 2 variable. To test whether the directional bias could be attributed to general levels of sexual desire, desire as measured at background was entered a predictor of the mean-level bias. In both models, we also tested whether tracking accuracy and assumed similarity differed based on motivations to avoid rejection or sexual desire, although we did not have specific predictions for these effects.

As in Studies 1 and 2, we tested the consequences of accurate and bias perceptions of a partner's sexual desire using multilevel polynomial regression with RSA (Shanock et al., 2010). First we ran a two-level cross model with separate intercepts for men and women to obtain the polynomial regression coefficients. We then used these values to calculate the surface tests using the excel spreadsheet from Shanock et al. (2010). As in the previous studies, our interest is in the values for a_1 and a_3 . Positive values for a_1 , the line of perfect agreement, indicate that when perceptions of partner desire and partner's actual desire are in agreement and increase, so do the outcomes, whereas negative values for a_1 suggest that the outcomes decrease. For a_3 , the line of disagreement, positive scores indicate that overperception is associated with greater satisfaction and commitment than underperception, and negative scores indicate that underperception is associated with greater satisfaction and commitment than overperception. Again, we used the R package RSAPlot to graph the results for relationship satisfaction.

Results

We report the T&B results for men and women in Table 5. We found that both men and women displayed significant tracking accuracy (i.e., they drew on their partner's actual desire in their perceptions) and assumed similarity between their own desire and their partner's desire (i.e., they projected their own feelings of desire onto their partner), and there were no significant gender differences in either of these effects. In addition, as predicted, and consistent with our findings in Studies 1 and 2, the results revealed

Table 5
Gender Differences in Directional Bias, Tracking Accuracy, and Assumed Similarity in Judgments of the Partner's Sexual Desire Across the Diary Period in Study 3

Judgments of partner's sexual desire	<i>b</i>	<i>SE</i>	<i>t</i>	95% CI	Effect size <i>r</i>
Directional bias					
Men	-.21	.06	-3.59***	-.33, -.09	.41
Women	-.19	.09	-2.23*	-.36, -.02	.23
Gender difference	.13	.06	2.37*	.02, .25	.27
Tracking accuracy					
Men	.16	.03	5.72***	.10, .21	.63
Women	.17	.03	6.50***	.12, .22	.64
Gender difference	-.001	.01	-.05	-.03, .03	.01
Assumed similarity					
Men	.74	.04	20.82***	.67, .81	.95
Women	.74	.03	26.19***	.68, .79	.95
Gender difference	-.003	.02	-.15	-.04, .03	.02

Note. In the model testing gender differences, men were coded as -1 and women were coded as 1. Approximate effect sizes were calculated using the formula $r = \sqrt{(t^2/(t^2 + df))}$ (see Overall & Hammond, 2013; Rosenthal & Rosnow, 2007). Degrees of freedom for effects ranged from 45.57 to 86.11.

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

that men significantly underperceived their partner's sexual desire. In this study, however, women also significantly underperceived their partner's desire. To test whether men significantly differed from women in their underperception bias, we tested gender moderations in the pooled model. The results indicated that men did, in fact, underperceive their partner's sexual desire to a greater degree than women, consistent with our predictions and the results of the previous two studies.

The consequences of accuracy and bias in perceptions of sexual desire. Next we tested how agreement and disagreement between perceptions of a partner's sexual desire and a partner's actual desire are associated with the relationship satisfaction and commitment of both partners. The results of the multilevel polynomial regression with RSA are displayed in Table 6 and revealed that for both men and women, when perceptions and actual partner desire are in agreement and increase (see a_1 values in Table 6), both their own satisfaction and commitment as well as their partner's satisfaction and commitment increase (see Figures 5 and 6). The line of disagreement (a_3) revealed that, for both men and women, overperception (when perceptions of partner's desire are higher than the partner's actual desire) is associated with their own feelings of higher relationship satisfaction and commitment compared to underperception (see Figure 5). However, as predicted and as in Studies 1 and 2 for men, the line of disagreement reveals that underperception is associated with their partner feeling more satisfied and committed to the relationship compared to overperception (see Figure 6). Women's underperception is not associated with their partner's satisfaction, but it does significantly predict their partner's feelings of commitment. Put another way, overperception is better than underperception for both men and women's own relationship quality, but underperception is better than overperception for a partner's relationship quality (and this is most consistent for men; men's underperception bias is associated with higher satisfaction and commitment for their partner, whereas for

Table 6

Testing the Consequences of Accuracy and Perceptual Bias by Gender Using Multilevel Polynomial Regression With Response Surface Analyses in Study 3

Gender	Multilevel polynomial regression coefficients						Surface values			
	b ₀	b ₁ P	b ₂ D	b ₃ P ²	b ₄ D×P	b ₅ D ²	a ₁	a ₂	a ₃	a ₄
Men										
Own rel sat	5.67 (.09)***	.29 (.02)***	.03 (.02)	.01 (.01)	-.01 (.01)	-.01 (.01)	.32***	.00	.26***	-.03
Own comm	5.86 (.09)***	.25 (.02)***	-.01 (.02)	.01 (.01)	.01 (.01)	-.01 (.01)	.25***	.01	.26***	.00
Par rel sat	5.63 (.10)***	.16 (.02)***	.24 (.02)***	.02 (.01)	-.02 (.01)*	-.01 (.01)	.40***	-.01	-.08**	-.05**
Par comm	5.88 (.10)***	.03 (.02)	.29 (.02)***	-.02 (.01)*	.02 (.01)*	-.01 (.01)	.32***	-.01	-.26***	-.04**
Women										
Own rel sat	5.57 (.09)***	.31 (.02)***	.08 (.02)***	-.01 (.01)	.01 (.01)	-.02 (.01)	.39***	-.02	.23***	-.01
Own comm	5.78 (.09)***	.25 (.01)***	.05 (.02)**	.01 (.01)	-.01 (.01)	-.002 (.01)	.31***	.00	.20***	.02
Par rel sat	5.52 (.10)***	.20 (.02)***	.17 (.02)***	-.001 (.01)	.001 (.01)	-.02 (.01)	.37***	-.01	.03	-.01
Par comm	5.80 (.09)***	.01 (.02)	.27 (.02)***	-.004 (.01)	.01 (.01)	-.004 (.01)	.27***	.00	-.26***	-.02

Note. P = perceptions of partner's desire; D = partner's actual desire; standard errors in brackets. The first key value of interest is a₁, the line of perfect agreement, where a significant positive value indicates that when perceptions of and partner's actual desire are in agreement and increase, relationship satisfaction/commitment increase. A significant negative value for a₁ indicates that when perceptions of and a partner's actual desire are in agreement and increase, relationship satisfaction/commitment decrease. The second key value of interest is a₃, the line of disagreement, where a positive value indicates that overperception is better than underperception for relationship satisfaction/commitment and a negative value for a₃ indicates that underperception is better than overperception for relationship satisfaction/commitment.

* $p < .05$. ** $p < .01$. *** $p < .001$.

women, underperception is associated with their partner's commitment only).

The role of motivation to avoid sexual rejection. In the next set of analyses, we tested whether the daily motivation to avoid sexual rejection strengthened men and women's underperception bias. As predicted, daily motivation to avoid sexual rejection significantly moderated the directional bias for both men ($b = -.09$, $SE = .03$, $t[1553.47] = -3.27$, $p = .001$) and women ($b = -.05$, $SE = .02$, $t[1584.94] = -2.37$, $p = .02$). Simple effects tests revealed that on days when their motivation to avoid sexual rejection was low, men and women did not significantly overperceive or underperceive their partner's sexual desire (men: $b = -.08$, $SE = .07$, $t[93.64] = -1.12$, $p = .27$; women: $b = -.05$, $SE = .09$, $t[86.61] = -.58$, $p = .56$); there was no significant gender difference in this effect ($b = .04$, $SE = .07$, $t[83.48] = .57$, $p = .57$). In contrast, on days when their motivation to avoid sexual rejection was high, men and women both underperceived their partner's daily sexual desire (men: $b = -.29$, $SE = .07$, $t[96.27] = -4.01$, $p < .001$; women: $b = -.17$, $SE = .09$, $t[83.89] = -1.99$, $p = .05$); men, however, underperceived their partner's sexual desire to a marginally greater extent than women ($b = .13$, $SE = .07$, $t[82.21] = 1.96$, $p = .053$).

The role of general level of sexual desire. In the next set of analyses, we tested whether the underperception bias in perceptions of a partner's sexual desire varies as a function of the person's own general level of sexual desire.⁵ Results revealed that general sexual desire, as reported at background, moderated the directional bias for both men ($b = -.09$, $SE = .04$, $t[76.27] = -2.11$, $p = .04$) and women ($b = -.11$, $SE = .05$, $t[89.90] = -2.13$, $p = .04$).⁶ Simple effects tests revealed that lower levels of general sexual desire exerted no influence on men's and women's perceptions of their partners' daily sexual desire across the diary period (men: $b = -.07$, $SE = .09$, $t[80.43] = -.77$, $p = .44$; women: $b = -.08$, $SE = .10$, $t[99.06] = -.74$, $p = .46$). In contrast, however, men and women who reported higher levels of general sexual desire significantly

underperceived their partner's daily sexual desire (men: $b = -.31$, $SE = .07$, $t[76.42] = -4.24$, $p < .001$; women: $b = -.37$, $SE = .12$, $t[99.51] = -3.18$, $p = .002$). There were no significant gender differences in the effects of general levels of sexual desire on directional bias, and general desire did not moderate the effects of tracking accuracy or assumed similarity, $ps > .15$.

Although both men and women with higher general sexual desire seemed to exhibit the underperception bias, we found evidence that, overall, men ($M = 5.94$, $SD = 1.15$) reported significantly higher general desire than women ($M = 5.48$, $SD = 1.39$), $t(190) = 2.58$, $p = .01$. Therefore, it is possible that one reason why men tend to report a stronger underperception bias than women is because they tend to report higher sexual desire. When women report higher sexual desire, they are also more likely to demonstrate an underperception bias.

Testing alternative explanations and generalizability. We conducted a series of additional analyses to test alternative explanations for and the generalizability of our findings. As in Study 1, the findings were not moderated by how satisfied participants reported being with their sex lives in general suggesting the sexual underperception bias (at least at the daily level) is not driven by people who are low in sexual satisfaction. In addition, because some previous work suggests that men may initiate sex more frequently than women (e.g., Simms & Byers, 2013), and as a result may get rejected more than women, we tested whether our findings could be accounted for by gender differences in sexual initiation and rejection. In this study, men and women did not initiate at significantly different rates (men initiated on 27% of days and women on 24% of days, $p = .62$), and men did not get

⁵ We also tested the moderation by general sexual desire and the moderation by daily motivations to avoid rejection in the same model and both moderation effects remained significant.

⁶ We also have a measure of general levels of sexual desire in Study 1, but we are underpowered to test a multilevel moderation with a Level 2 moderator in Study 1, so we only test and report this analyses in Study 3.

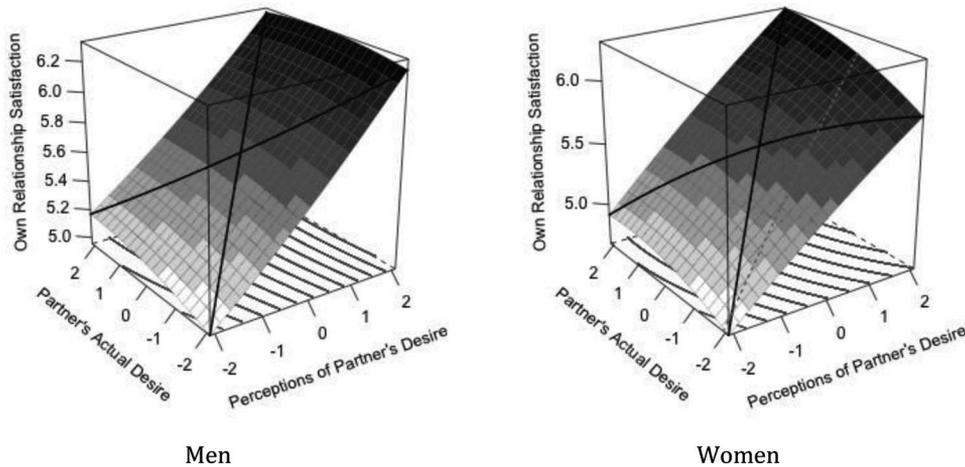


Figure 5. Response surface plots for the effect of perceptions of a partner's desire and a partner's actual desire on a person's own relationship satisfaction by gender (Study 3).

rejected significantly more frequently than did women (when sex was initiated, men were rejected 32% of the time whereas women were rejected 24% of the time, $p = .21$). Furthermore, men's underperception bias remained significant even after controlling for whether or not they initiated sex that day, whether or not they actually had sex that day, and how motivated they were to avoid sexual rejection. These results suggest that the underperception bias is not driven by gender differences in sexual initiation or rejection experiences, which helps to support our prediction that this effect is at least partially attributed to motivational processes and not simply to cognitive errors in judgments.

Finally, to bolster our confidence that the underperception bias is motivated by the desire to avoid sexual rejection, and not the reverse, where underperceiving a partner's desire leads to increased motivation to avoid rejection, we also tested whether our effects were moderated by whether or not sex was initiated. If underperception were, in fact, causing people to avoid rejection

and not initiate sex, we would expect to see a stronger effect on days when people did not initiate sex. The findings indicate, however, that the effect of motivation to avoid rejection on the directional bias was not moderated by whether the person initiated sex or not. That is, men (and women) demonstrated an underperception bias when they were motivated to avoid rejection, both on days they initiated sex with their partner and on days when they did not, providing support for the predicted direction of effects that being motivated to avoid rejection leads to underperceiving a partner's sexual desire.

General Discussion

Men's sexual overperception bias, where men perceive more sexual interest in women's behavior than actually exists, has been well-documented in previous research (see Haselton & Galperin, 2013). However, all of the existing research has been conducted in

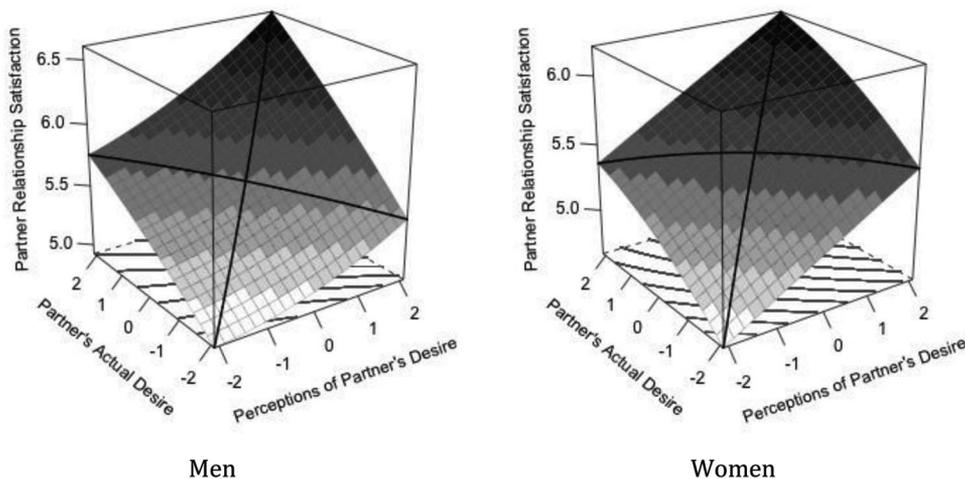


Figure 6. Response surface plots for the effect of perceptions of a partner's desire and a partner's actual desire on a partner's relationship satisfaction by gender (Study 3).

the context of initial encounters between strangers or for judgments of unknown others in videos or photographs. The current studies provide the first empirical test of perceptual bias for a romantic partner's sexual desire in the context of an established relationship. Across three dyadic studies (two of which are 21-day daily experience studies), we demonstrate that men in romantic relationships do not overperceive their partner's sexual desire as they tend to do in initial encounters, but instead show the opposite bias: they *underperceive* their partner's sexual desire. We also provide evidence that this underperception bias is functional in the context of relationships (particularly for men) in that underperceiving (relative to overperceiving) is associated with a partner feeling more satisfied with and committed to the relationship. The sexual underperception bias is also calibrated by a person's motivation to avoid sexual rejection. Both men and women show a stronger underperception bias on days when their motivation to avoid sexual rejection is high, whereas on days when their motivation to avoid sexual rejection is low, neither show a significant underperception bias. Finally, we demonstrate that the underperception bias is strongest for men (and women) who reported higher sexual desire. Because men, in general, report higher sexual desire than women (Baumeister et al., 2001), this could be one reason why men tend to demonstrate a stronger overperception bias.

Extending Previous Research and Theory

Although men's sexual overperception bias is a robust effect in previous research, past work in this area had not investigated perceptions of sexual interest outside of the context of initial encounters between strangers. The current set of studies provides the first empirical test of accuracy and bias in judgments of a partner's sexual desire in the context of established relationships and demonstrate that men's perceptual biases do, in fact, differ in this context. The sexual underperception bias in the context of romantic relationships is consistent with theory and empirical evidence on perceptual biases in relationships (Fletcher & Kerr, 2010; Fletcher, 2015). This line of inquiry suggests that although overperceiving a partner's individual attributes can have positive consequences for relationship quality and maintenance (e.g., Murray et al., 1996), overperceiving interaction traits (i.e., traits that focus on the connection between the self and the partner), can be costly for romantic relationships in that they can make a person complacent about attracting their partner's interest (Fletcher & Kerr, 2010). In contrast, the underperception of interaction traits can motivate people to take strides to attract their partner's interest and maintain closeness in the relationship (Fletcher & Kerr, 2010). In the current set of studies, for the first time, we extend theories of perceptual accuracy and bias in relationships to the domain of sexuality, and find that men in relationships demonstrate a sexual underperception bias and that this is functional in that it is associated with their partner feeling more satisfied and committed. In two instances, underperception was shown to be functional for women as well, in that it was associated with their partner feeling more satisfied (Study 1) and more committed to the relationship (Study 3). Although, overall, the sexual underperception bias was functional for men, in some instances, it may be functional for women, perhaps when they are higher in desire than their partner.

The results of Study 3 suggest that underperceiving a partner's desire is calibrated by men's (and women's) desire to avoid sexual

rejection. These findings extend risk regulation theory in close relationships (Murray et al., 2006) to the domain of sexuality, demonstrating that on days when men (and women) were more motivated to avoid sexual rejection, they more strongly underperceived their partner's sexual desire. Risk regulation theory suggests that romantic partners are simultaneously motivated to pursue closeness in their relationships and minimize their vulnerability to rejection (Murray et al., 2006, 2008). The current findings suggest that the sexual underperception bias is relevant to both motivations; underperception is associated with relationship quality and maintenance (primarily for men) and is calibrated based on proximate motivations to avoid sexual rejection. Perceptual biases then, seem to be one mechanism through which romantic partner's regulate closeness and rejection risk in romantic relationships.

Although there tend to be few systematic gender differences in the literature on risk regulation, in the current studies we consistently find that men underperceive their partner's sexual desire, but women do not (or do to a lesser extent as in Study 3). A wealth of research has found that men tend to report greater sexual interest than women (for a review, see Baumeister et al., 2001), and the standard North American sexual script casts the male partner as "taking the lead" in sexual situations and the female partner as the passive recipient (e.g., Dworkin & O'Sullivan, 2005; Sakaluk et al., 2014; Salisbury & Fisher, 2014; Vannier & O'Sullivan, 2011). Having higher desire may mean that men in heterosexual partnerships feel more responsible for the maintenance of sexual aspects of the relationship and are more assertive about their sexual interest (Santos-Iglesias et al., 2013). In fact, in Study 3, we demonstrate that sexual desire moderates the underperception bias. That is, both men and women who report high levels of general desire demonstrate a significant underperception bias, but those who report low desire do not show a significant directional bias. This finding provides two interesting insights about the sexual underperception bias. First, one function of the underperception bias may be to help high desire partners maintain their motivation to attract their partner's interest, and second, this bias may not be gendered per se, but could be, at least partially, attributed to levels of sexual desire, on which men tend to report being higher. In Study 3, although men's underperception bias is stronger, we also see an underperception bias for women, and this is particularly true for high desire women.

In the current research, our findings about the sexual underperception bias in relationships are robust across whether or not couples reported sex on a particular day and whether or not sex was initiated. However, in Study 2, perceptual biases differed based on participants overall sexual satisfaction and sexual frequency. When men reported engaging in more frequent sex, they did not underperceive their partner's sexual desire, and men who were highly sexually satisfied even overperceived their partner's desire. It was men who reported low sexual frequency and low sexual satisfaction who demonstrated the strongest underperception bias. In the daily diary studies (Studies 1 and 3), however, sexual satisfaction and frequency did not moderate the directional bias. Taken together, these results suggest that sexual frequency and satisfaction do not seem to impact daily, situation-specific perceptions of a partner's desire, but may impact general perceptions of a partner's sexual desire (because Study 2 was cross-sectional and based on general perceptions). In Study 2, women's

perceptual biases also differed based on their sexual frequency and satisfaction. When women reported frequent, satisfying sex, they overperceived their partner's desire, whereas women low in sexual satisfaction underperceived and women who reported low sexual frequency did not demonstrate a directional bias. An interesting avenue for future research is to test how biased perceptions of sexual desire differ based on specificity (i.e., whether people are reporting on their partner's general sexual desire compared to their desire on a particular day). It seems that the underperception bias might be more robust across levels of sexual satisfaction and frequency in the context of daily interactions in relationships, but that general perceptions of partner's desire are more strongly influenced by sexual activity and satisfaction.

The current studies also extend previous research on sexual perception by utilizing the T&B model of human judgment, an advanced statistical modeling technique that allows for the simultaneous estimation of three perceptual biases: directional bias (i.e., over- or underperception), tracking accuracy, and assumed similarity (West & Kenny, 2011). Consistent with previous research (Overall et al., 2012; Overall & Hammond, 2013), we demonstrate that romantic partners can be both accurate and biased when making judgments about their partner's sexual desire. In Studies 1 and 3, although men and women both accurately tracked their partner's sexual desire over a 21-day study, men (and women in Study 3) also demonstrated an underperception bias. Previous research in the domain of sexuality suggests that romantic partners tend to be fairly accurate when judging each other's sexual satisfaction (Fallis et al., 2014) and sexual preferences (Miller & Byers, 2004), and in the current set of studies we find evidence for men's and women's accuracy in detecting their partner's sexual desire. Consistent with previous research on perceived partner responsiveness in romantic relationships (Lemay & Clark, 2008; Lemay et al., 2007), we also found that both men and women projected their own feelings of desire when making judgments about their partner's desire. In research on perceptions of a partner's responsiveness, projection of one's own responsiveness when making judgments about a partner's responsiveness is associated with increased relationship satisfaction over time. Therefore, projection (i.e., assuming similarity between oneself and their partner) in certain domains of relationship may be a strategy for relationship maintenance. Previous research with unacquainted dyads has demonstrated that both men and women project their own sexual interest when making judgments about their interaction partner's sexual interest (Henningsen & Henningsen, 2010), but the current research is the first to test romantic partners' projection of sexual desire in the context of established relationships.

Implications, Limitations, and Future Directions

Theories of perceptual biases in romantic relationships (e.g., Fletcher, 2015; Fletcher & Kerr, 2010) suggest that underperception can help to ward off complacency and compel people to work to attract or maintain their partner's interest. However, it is not clear from the current research what people actually do to attract their partner's interest in response to underperception. It is possible that people engage in positive relationship behaviors to enhance their partner's positive regard for them and ultimately their feelings of relationship satisfaction and commitment. Previous work suggests that when people feel more satisfied and committed in

their relationships, they also tend to report higher desire for their partner (Breznyak & Whisman, 2004; Regan, 2000). Therefore, aiming to increase a partner's relationship satisfaction may be one route to enhancing their sexual desire. An interesting area for future research would be to explore how people respond when they perceive their partners to have low levels of sexual interest. An ideal test of this would be to track couples over time, assessing their daily relationship activities and test how perceptions of a partner's sexual desire is associated with prorelationship behaviors. Similarly, future inquiry in this area would benefit from testing possible mechanisms, such as engaging in relationship maintenance strategies or attempting to entice a partner's interest, for the association between underperception of sexual desire and partner's feelings of relationship satisfaction and commitment.

In the current studies we focused on perceptions of a romantic partner's desire, but it is not known how these same people would perceive the sexual interest of targets other than their current partner. It is possible that men who underperceive their partner's sexual desire would still demonstrate an overperception bias when making judgments about other women's sexual interest. In fact, in one study of previously unacquainted dyads, men's sexual overperception bias did not differ based on the reported relationship status of the participants (Henningsen & Henningsen, 2010). Other research, however, suggests that people in committed relationships pay less attention to attractive alternatives (e.g., Maner, Rouby, & Gonzaga, 2008), so it is also possible that men who are highly committed may also underperceive other women's desire as a protective strategy for maintaining their relationship.

Conclusions

Staying attuned to a romantic partner's sexual needs and desires can be a difficult task. In the current studies, we demonstrate, for the first time, that perceptual biases in judgments of a partner's sexual desire exist and are functional in the context of romantic relationships. Across three studies we demonstrate that men tend to underperceive their partner's sexual interest, and this sexual underperception bias is associated with their partner feeling more satisfied and committed, and is calibrated by motivations to avoid sexual rejection. Men's sexual underperception bias in relationship is, at least in part, attributed to their tendency to have higher general levels of desire than women. The current research suggests that the sexual underperception bias may help manage the careful balance between pursuing sexual connection and avoiding sexual rejection.

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