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Functional Flexibility in Women's Commitment-Skepticism Bias

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Abstract: If a woman overestimates her romantic partner's commitment, the cost to her fitness—reproduction without an investing partner—can be considerable. Error Management Theory predicts that women have an evolved bias to be skeptical of men's commitment in a relationship, which reduces the likelihood of making a costly false positive error. However, because error probabilities are inversely related, this commitment-skepticism bias simultaneously increases the likelihood of missed opportunities, or false negatives. False positives when gauging a partner's commitment are the more costly error for women, but missing an opportunity to secure a genuinely high-quality mate can also be quite costly. We predicted and found that women's mating cognitions are functionally flexible, such that women do not exhibit the commitment-skepticism bias when faced with behavioral evidence that a male partner is willing to commit (Study 1). This suggests that relationship-enhancing behaviors are one contextual cue that may lessen the bias. However, not all relationship-enhancing behaviors are equally diagnostic of a person's true commitment intent. When comparing men and women's commitment thresholds, we found that women require more behavioral evidence than men do to feel certain of their partner's commitment to them (Study 2).

Keywords: commitment skepticism, error management, judgment, sex differences, mating, judgment bias

Introduction

Heuristics and biases tend to receive the most attention when they create judgment errors (Haselton and Funder, 2006). However, Haselton and Buss's (2000) Error Management Theory (EMT) interprets certain heuristics and biases as evidence of adaptive cognition and notes that their output is generally useful. EMT states that mental processes have evolved over time, with humans developing biases to think or respond in ways that

have increased reproductive success in the past. Virtually all decisions contain some degree of uncertainty about which choice will produce the optimal outcome for the person. According to EMT, decision makers faced with uncertainty exhibit adaptive biases when the decision is in a domain that has had recurring consequences for survival and reproduction in the past.

From a signal detection framework, decision makers can commit two types of errors: A false positive (i.e., Type I error) is stating the presence of a stimulus when it is absent, whereas a false negative (i.e., Type II error) is failing to recognize the presence of a stimulus. According to EMT, there are certain decision-making domains that have recurred over evolutionary history in which the two types of errors have reliably differed in their cost or benefit to the individual's fitness (Haselton and Buss, 2000). Natural selection has shaped humans to be biased to choose the option that, if incorrect, will be the least costly error.

A classic example is the predator-alarm bias (Barrett, 2005). A person who is hiking in the woods and hears movement in the leaves should be biased to first interpret the sound as a threat (a positive, or "stimulus present," response in signal detection) and react correspondingly (e.g., attending to the sound and behaving with caution). In this situation, overreacting to a benign noise (a false positive) is a less costly error to one's fitness than missing a real threat (a false negative). In this context, the bias toward making a positive response is a functional one.

Based on EMT, Haselton and Buss (2000) propose that men and women should exhibit biases in mating decisions, a domain critical to reproduction yet filled with uncertainty. Sex differences in reproductive physiology and parental investment (e.g., Buss and Schmitt, 1993) create cost asymmetries in men and women's mating decisions, and therefore men and women should exhibit different biases when faced with uncertainty about a potential mate. Haselton and Buss (2000) predict that women should exhibit a *commitment-skepticism bias* in which they underestimate how committed a male partner will be to them, because it is more costly for women (relative to men) to reproduce with a partner who will abandon them than to miss an opportunity to reproduce with a partner who would remain committed. The former error represents a false positive, whereas the latter is a false negative; women should be biased toward making negative judgments (believing a potential mate won't be committed) because, if they are incorrect, this error would be less costly than a false positive.

As for men, Haselton and Buss (2000) predict a *sexual overperception bias*, such that men will tend to overestimate a woman's sexual interest in them. Because women are "sexual gatekeepers" (Baumeister and Vohs, 2004), missing the opportunity to mate with a woman who is interested in them (a false negative) is more costly than pursuing a woman who will ultimately reject them (a false positive). The cost of a false positive is wasted time and effort courting the woman before receiving her rejection, which is much milder than the cost of a false negative: losing a potential opportunity for reproduction.

Evidence for and flexibility of the commitment-skepticism bias

There is considerable evidence for a sexual overperception bias in men (e.g., Abbey, 1987; Haselton, 2003; Haselton and Buss, 2000; Henningsen and Henningsen, 2010; Koenig, Kirkpatrick, and Ketelaar, 2007; Perilloux, Easton, and Buss, 2012), although it is moderated by both the perceiver's personality (Jacques-Tiura, Abbey,

Parkhill, and Zawacki, 2007; Perilloux et al., 2012) and the target's mate value (Koenig et al., 2007; Perilloux et al., 2012). There are considerably fewer studies on a commitment-skepticism bias in women.

A commitment-skepticism bias is found when women's estimates of men's willingness to commit are significantly lower than men's estimates *for themselves* and *for other men*. Men's estimates for themselves might be slightly inflated as a result of strategic self-enhancement; likewise, men might underreport other men's commitment out of a desire to derogate potential rivals (Haselton and Buss, 2000). Haselton and Buss suggest that the "truth" is most likely somewhere between men's self-estimates and estimates for other men, and therefore the most compelling evidence for the commitment-skepticism bias is when women's estimates are below both male estimates.

Haselton and Buss (2000) and Cyrus, Schwarz, and Hassebrauck (2011) have observed a commitment-skepticism bias in young women by asking women and men to evaluate three targets' willingness to commit in romantic relationships: themselves, typical men, and typical women. For example, participants indicate their agreement with questions such as, "Most men at my age prefer many different sex partners over getting committed to one partner." Young women perceive men in general as less willing to commit than men perceive themselves and other men (Cyrus et al., 2011; Haselton and Buss, 2000).

Henningsen and Henningsen (2010) also observed a commitment-skepticism bias during actual male-female dyadic interactions. In their study, opposite-sex undergraduate student dyads had a 5-minute face-to-face "getting acquainted" conversation, after which they each reported their own and their partner's desire for a committed relationship with one another. Overall, women's estimates of their male partners' interest in a committed relationship were lower than those men's actual self-reported interest in commitment. However, when the women themselves were quite interested in pursuing a committed relationship with their partner, they no longer underestimated their partner's commitment (a finding to which we will later return).

The research by Haselton and Buss (2000), Henningsen and Henningsen (2010), and Cyrus et al. (2011) represent the only published demonstrations of the commitment-skepticism bias that we were able to find, compared to the mature literature on the sexual overperception bias in men (in fact, see La France, Henningsen, Oates, and Shaw [2009] and Perilloux [2014] for a meta-analysis and review, respectively, on men's sexual overperception).

Just as characteristics of both the perceiver and the target have been found to moderate men's sexual overperception, perceiver characteristics also moderate women's commitment-skepticism. Specifically, Cyrus et al. (2011) observed that the commitment-skepticism bias, as measured by general questions, was only present in women under the age of 34. The bias was absent in women who were post-menopausal and therefore did not face the risk of pregnancy without partner investment, which is theorized to drive the bias. In addition, Peterson, Carmen, and Geher (2013) recently found a positive correlation between women's current likelihood of conceiving a child and their perception that men want sex without commitment.¹ Both datasets indicate that women are more cautious in

¹ This study did not include male participants, so the conclusion from this research is that high conception-risk women are more skeptical of men's commitment relative to low conception-risk women. We do not know if and to what degree their skepticism underestimated men's self-reported desire for commitment.

their belief that men are willing to commit when the risk of pregnancy without an investing partner is greatest. This suggests that the commitment-skepticism bias is “functionally flexible” (Schaller, Park, and Kenrick, 2007) rather than fixed.

It is important to recall, however, that Henningsen and Henningsen (2010) found that women accurately estimated their male partner's commitment interest when they themselves were quite interested in committing to him. This could indicate simple projection of one's own interest onto the target of that interest (for which there is considerable evidence; see Koenig et al., 2007; Lenton, Bryan, Hastie, and Fischer, 2007), which is how the authors interpreted this finding. Alternatively, we suggest that perhaps those women detected a desirable quality in their partners that both increased their attraction and inhibited the bias. Although there is no evidence for our suggested interpretation, inhibiting the bias when faced with evidence of actual commitment interest on the man's part would in fact be quite functional, as it would prevent women from missing an opportunity to pursue a high-quality mate (an error that could be quite costly). If the commitment-skepticism bias is down-regulated in the presence of a potential mate who possesses desirable qualities—such as actual willingness to commit—this would be additional, yet novel, evidence of functional flexibility in women's mating cognitions.

The current research

The purpose of the current research was to test the conditional nature of the commitment-skepticism bias. We suggest that women's skepticism of men's commitment is responsive to men's behavior. First, we predict that when women receive information suggesting that a man is indeed committed, the commitment-skepticism bias will be diminished. However, this does not mean that women should be quick to interpret any potential sign of commitment as indisputable evidence of commitment. Instead, women should be discriminating in what they consider a valid sign of commitment. To this end, our second prediction was that women will have a higher threshold than men for accepting a partner's actions as evidence of commitment.

We conducted two studies to test our hypotheses. These were preceded by a pilot study in which we first sought to replicate the commitment-skepticism bias with our particular participant population (individuals recruited via Amazon.com's Mechanical Turk) while using the same measure of general commitment beliefs used by other researchers. After establishing that the commitment-skepticism bias is indeed present in our population, we conducted Study 1 using the same population and the same measure to test whether the bias is reduced by behavioral evidence that a partner wants commitment in the relationship.

Behavior can be a rich source of information about another person's intentions and disposition. Of course, people can also strategically change their behavior to produce a desired impression, but in general perceivers form fairly accurate impressions of other people based on their behavior (e.g., Funder, 1995; Vazire, 2010). A committed man may be considered a “limited resource” for which women compete with one another (Bleske and Shackelford, 2001), and if certain relationship-enhancing behaviors are indeed evidence of genuine commitment, “missing” this signal may actually become the more costly error. In other words, if women down-regulate their skepticism about men's commitment in the face of compelling evidence of commitment, this might be evidence of functional flexibility in cognitive biases.

We conducted Study 1 to test our interpretation that *specific relationship-enhancing behaviors* are a signal that reduces the commitment-skepticism bias in women, and we did this by selecting behaviors that were pre-tested to be seen as highly indicative of commitment. However, there are other, easy-to-fake behaviors that people can engage in to falsely convince a partner of their commitment intentions. The existence of these behaviors makes it maladaptive for women to relax the bias in the presence of *any* evidence of commitment. Therefore, Study 2 compared men and women's thresholds for perceiving commitment in a partner, and we predicted that women would require more behavioral evidence than men before they are certain of a partner's commitment. Collectively, the goal of these two studies is to show that while the commitment-skepticism bias exists, it is also functionally flexible, such that women do not continue to doubt their partners when presented with diagnostic evidence of commitment intent.

Pilot study

Overview

A pilot study was first conducted to test whether the commitment-skepticism bias is replicated in the participant population we intended to use for Studies 1 and 2.

Materials and Methods

Participants

A total of 130 participants were recruited from Amazon.com's Mechanical Turk (MTurk; see Buhrmester et al., 2011). MTurk is an online system in which businesses and researchers (called "requesters") offer a small amount of monetary compensation for participants (called "workers") to complete brief and simple online tasks. In all studies reported here, we limited our survey to participants residing in the United States. Participants were paid 15 cents for their time.

Because the commitment-skepticism bias concerns heterosexual relationships, we only analyzed the data of participants who revealed a heterosexual orientation (by indicating that they are most attracted to the opposite sex). In addition, because Cyrus et al. (2011) found commitment-skepticism only in younger women, we used their age cut-off of 34 or younger.² After excluding non-heterosexual and participants older than 34, our final sample consisted of 82 participants (37 men, 45 women; $M_{\text{age}} = 25.26$; $SD_{\text{age}} = 4.63$).

Measures

We used each of Cyrus et al.'s (2011) unique questions about commitment perceptions. Specifically, we used items 1–5 from their Study 1 and items 2–7 from their Study 2 (item 1 from Study 2 was redundant with item 5 from Study 1). Participants answered these 11 items in three blocks: in reference to the self (e.g., "I prefer many different sex partners over getting committed to one partner"), in reference to men in their age group (e.g., "A typical man at my age needs to know that a woman loves him before he is willing to have sex with her"), and in reference to women in their age group (e.g., "As

² When older participants are included in the sample, we still obtained a significant commitment-skepticism bias.

long as a woman at my age can have lots of sex without commitment, she will avoid getting committed to one man"). Depending on block, participants indicated the extent to which they thought each statement was true of themselves, men in their age group, or women in their age group on a scale of 1 (strongly disagree) to 7 (strongly agree).

Participants completed each of the three commitment blocks in the same order: self, same-sex, and opposite-sex. The scale was reliable (women rating self $\alpha = .85$; men rating self $\alpha = .82$; women rating men $\alpha = .86$; men rating men $\alpha = .83$; women rating women $\alpha = .87$; men rating women $\alpha = .88$).

Procedure

After providing informed consent, participants indicated whether they were most attracted to men or women. They then completed each of the three commitment blocks, followed by demographic questions.

Results and Discussion

The commitment-skepticism hypothesis is that women will underestimate a male partner's commitment, relative to men's self-reported commitment and same-sex reports.

First, women perceived less commitment in men ($M = 3.04$, $SD = .93$) than men perceived in other men ($M = 3.50$, $SD = .91$), $t(80) = 2.23$, $p = .029$, $d = .50$, and less than men reported for themselves ($M = 5.04$, $SD = .92$), $t(80) = 9.73$, $p < .001$, $d = 2.16$. Women's underestimation of men's commitment, relative to both men's impression of other men and of themselves, reflects the commitment-skepticism bias. Not surprisingly, men saw themselves as considerably more committed than other men, $t(36) = 6.12$, $p < .001$, $d = 1.01$, which could reflect both self-enhancement and rival derogation.

Second, men's perception of women's commitment ($M = 4.75$, $SD = .91$) did not differ from women's perception of other women's commitment ($M = 4.73$, $SD = .99$), $t(80) = .09$, $p = .93$, $d = .02$. Replicating Cyrus et al. (2011), women saw themselves as more committed ($M = 5.92$, $SD = .94$) than men saw women, $t(80) = 5.67$, $p < .001$, $d = 1.26$. Cyrus et al. (2011, p. 11) interpret this as evidence that women also use self-enhancement tactics. Supporting this self-enhancement interpretation, women (like men) rated their own commitment significantly higher than they rated the commitment of other members of their sex, $t(44) = 6.13$, $p < .001$, $d = .92$.

To summarize, we successfully replicated the commitment-skepticism bias using a sample of adults recruited from MTurk and measuring commitment with questions assessing general perceptions of oneself, the same sex, and the opposite sex (e.g., Cyrus et al., 2011).

Study 1

Overview

We predicted that the commitment-skepticism bias is functionally flexible, such that women will not exhibit the bias when faced with diagnostic cues about a man's willingness to commit to his partner. To test this, we manipulated whether participants reported their perceptions of commitment while imagining that a romantic partner had displayed certain commitment-signaling behaviors. The control condition was similar to the pilot study. In

the behavior condition, participants were told to imagine they were evaluating a person who had displayed the four commitment-signaling behaviors. These behaviors were selected based on a second pilot study, $n = 74$, in which participants rated the degree of commitment conveyed by various relationship behaviors.

Materials and Methods

Participants

A total of 261 participants were recruited from MTurk. They were paid 20 cents for their time. In addition to asking participants which sex they were most attracted to (as we did in the pilot study), we also asked participants to self-report their sexual orientation at the end of the study. Participants' reported attraction did not always match their reported sexual orientation, which could reflect bisexuality or inattentive responding. To be cautious, we only analyzed the data of participants who both self-reported as heterosexual and indicated being most attracted to the opposite sex. After excluding non-heterosexual participants and those over the age of 34, our final sample had 117 men and 51 women ($M_{\text{age}} = 25.92$; $SD_{\text{age}} = 4.63$).

Measures

Participants rated their agreement with the same 11 statements about commitment perceptions (e.g., "A typical man at my age needs to know that a woman loves him before he is willing to have sex with her") that were used in the pilot study (from Cyrus et al., 2011). They rated their perceptions in three blocks, ordered as follows: opposite-sex, same-sex, self. Each statement was rated on a scale of 1 (strongly disagree) to 7 (strongly agree). In the control condition, participants were simply told, "Please answer the following questions [about yourself]/[based on a typical heterosexual man in your age group]/[based on a typical heterosexual woman in your age group]."

Prior to seeing the commitment statements, participants in the behavior condition were told to imagine they were rating someone who had engaged in certain behaviors. Below are the instructions that participants saw in the self-block (the male version is displayed; pronouns were switched for female participants):

Regardless of your current relationship status, please imagine that you are dating a woman and you display these behaviors:

- You surprise her with a gift of something she once mentioned she really wanted.
- You cancel your plans when she needs help with something.
- You stay up late to talk to her about problems she's having, even though you have to wake up early.
- You tell your friends about how great she is.

Please answer the following questions based on this imagined version of yourself.

For the same-sex and opposite-sex blocks, similar instructions were used. For example, the male same-sex instructions began: "Please imagine a typical heterosexual man in your age group. Imagine that this man is dating a woman and displays these behaviors: He surprises her with a gift of something she once mentioned she really wanted..." etc.,

and ended with, "Please answer the following questions based on your impression of this man."

The measure of commitment perceptions was reliable (women rating self $\alpha = .88$; men rating self $\alpha = .91$; women rating men $\alpha = .96$; men rating men $\alpha = .92$; women rating women $\alpha = .88$; men rating women $\alpha = .89$).

Procedure

After providing informed consent, participants indicated their own sex and the sex to which they were most attracted. They were then randomly assigned to either the control or behavior condition. The last page of the survey contained demographic questions.

Results

Perceptions of men

Does women's underestimation of men's commitment depend on whether they are judging the commitment of a typical man or a man who has engaged in behaviors that convey commitment? We conducted two 2 (sex) \times 2 (condition) ANOVAs on perceived commitment in men. The variable of sex in the first ANOVA represented women's ratings of men versus men's self-ratings. In the second ANOVA, sex represented women's ratings of men versus men's ratings of other men.

The first ANOVA revealed two significant main effects, which were qualified by a significant interaction, $F(1, 164) = 19.44, p < .001, \eta_p^2 = .11$. Simple effects analyses showed that in the control condition, women underestimated men's commitment ($M = 3.55, SD = 1.08$) relative to men's self-ratings ($M = 4.95, SD = 1.26$), $F(1, 164) = 25.61, p < .001, \eta_p^2 = .14$. However, the commitment skepticism bias did not occur in the behavior condition; women's perception of men ($M = 5.30, SD = 1.18$) did not significantly differ from men's self-ratings ($M = 4.97, SD = 1.11$), $F(1, 164) = 1.41, p = .237, \eta_p^2 = .01$. In fact, in the behavior condition women tended to see *more* commitment in men's behavior than men reported for themselves. Analyzing the simple effects another way, men's perceptions of their own commitment was unaffected by condition, $F(1, 164) = .01, p = .932, \eta_p^2 < .01$, whereas women's perception of men's commitment was significantly greater in the behavior condition, $F(1, 164) = 28.52, p < .001, \eta_p^2 = .15$. In other words, the behavior manipulation eliminated the commitment-skepticism bias by increasing women's perception of men's commitment.

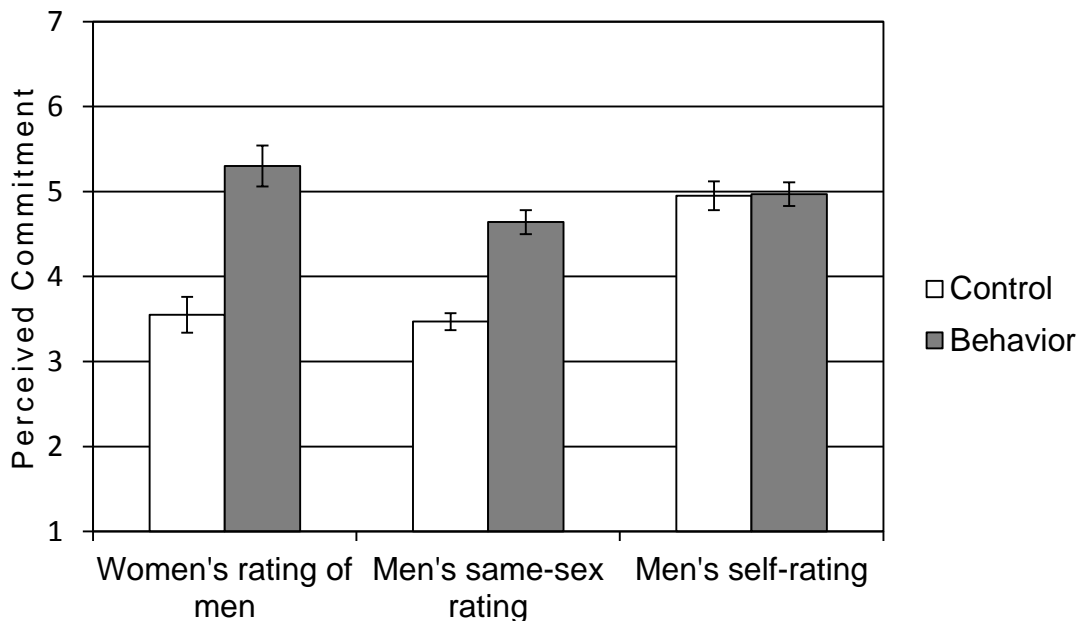
When women's underestimation was judged by comparing their perceptions of men to men's perceptions of other men (instead of men's self-ratings), the commitment-skepticism bias was not replicated. This 2×2 ANOVA also revealed a marginally significant interaction, $F(1, 164) = 2.88, p = .092, \eta_p^2 = .02$, but the pattern differed from the significant interaction with men's self-ratings. In the control condition, women's perceptions of men (see previous paragraph for M s) did not significantly differ from men's perceptions of other men ($M = 3.47, SD = .78$), $F(1, 164) = .13, p = .724, \eta_p^2 < .01$. However, in the behavior condition, women saw men as *more* committed than men saw other men ($M = 4.64, SD = 1.09$), $F(1, 164) = 7.53, p = .007, \eta_p^2 = .04$. Recall that the same pattern was observed when men's self-ratings were the referent (i.e., the first ANOVA), but the pattern was not significant. This hints that men may believe other men are being deceptive or strategic when they engage in these behaviors (to convince their partners of

their commitment), but believe that these behaviors indicate genuine commitment if they engage in these actions themselves.

As in the pilot study, men rated themselves as significantly more committed than other men, $t(116) = 7.47$, $p < .001$, $d = .69$. If self-enhancement and rival derogation cause inflated self-ratings and underestimated same-sex ratings, with the true estimate of men's commitment lying somewhere in the middle, it could be worth comparing women's ratings of men to the mean of men's self and same-sex ratings. The mean score of men's self-rating and same-sex rating in the control condition was 4.21, and women's rating of men in the control condition was significantly below this mean, $t(25) = -3.11$, $p = .005$, indicating commitment-skepticism. In contrast, the mean of men's self and same-sex ratings in the behavior condition was 4.81, and women's rating of men was significantly greater than this mean, $t(24) = 2.07$, $p = .049$. This means that women underestimated men's commitment in the control condition but overestimated men's commitment intentions when judging a man who had engaged in relationship-enhancing behaviors. In other words, the behavior condition reversed the commitment-skepticism bias (see Figure 1).

For interested readers, we also conducted the analyses with older participants included. These analyses replicated all significant main effects and interactions reported above.

Figure 1. Men and women's ratings of men's commitment by condition



Perceptions of women

We conducted two 2 (sex) \times 2 (condition) ANOVAs on perceived commitment in women, the first comparing men's perception of women to women's self-ratings and the second comparing men's perception of women to women's perceptions of other women.

The first ANOVA revealed only a main effect of sex, $F(1, 164) = 44.65$, $p < .001$, $\eta_p^2 = .21$, with men seeing women as less committed ($M = 5.17$, $SD = .89$) than women see

themselves ($M = 6.12$, $SD = .82$). This pattern was also found in the pilot study and in Cyrus et al.'s (2011) research.

The second ANOVA revealed only two significant main effects. Men saw women as less committed than women saw other women ($M = 5.56$, $SD = .86$), $F(1, 164) = 7.66$, $p = .006$, $\eta_p^2 = .05$. In addition, ratings of women's commitment were higher in the behavior condition ($M = 5.46$, $SD = .95$) than in the control condition ($M = 5.12$, $SD = .80$), $F(1, 164) = 4.36$, $p = .038$, $\eta_p^2 = .03$. The main effect of behavior is not surprising, although the main effect of sex reveals that men are underestimating women's commitment in this study.

Lastly, like men, women rated themselves as significantly more committed than other members of their sex, $t(50) = 5.42$, $p < .001$, $d = .77$.

Once again, for interested readers we repeated the analyses with older participants included. All significant main effects and interactions replicated in these analyses, although the non-significant interaction ($p = .167$) between women's self-ratings and men's ratings of women became significant, $F(1, 224) = 6.51$, $p = .011$, $\eta_p^2 = .028$. This interaction revealed that, when older adults are included in the sample, the behavior condition significantly increased men's perception of women's commitment, $F(1, 224) = 11.43$, $p = .001$, $\eta_p^2 = .05$, but it did not change women's self-ratings, $F(1, 224) = .45$, $p = .505$, $\eta_p^2 < .01$.

Discussion

In the control condition—which mirrored the pilot study—we replicated the commitment-skepticism bias when comparing women's perception of men to men's perception of themselves, but not when comparing women's perception of men to men's perceptions of other men. However, we did replicate the commitment-skepticism bias when the male referent was the statistical mean of men's ratings of themselves and other men (which may be considered a better estimate of men's true commitment because it adjusts for both self-enhancement and rival derogation). Surprisingly, the behavior condition did not simply eliminate the bias; it completely reversed it, so women actually overestimated men's commitment.

Although we interpret our data as women being sensitive to men's behavior—because behavior provides evidence of actual commitment intentions—it's worth noting that the behavior manipulation did not affect men's self-ratings of commitment. In other words, men's reported interest in a committed relationship was not affected by imagining that they had exhibited relationship-enhancing behaviors. We see two possible interpretations of this: First, it may be that men use these behaviors to convince their partners that they desire commitment, and therefore these behaviors are strategic rather than diagnostic. In other words, men know the behaviors are simply “for show,” but women are convinced by them. A second, and very different, explanation is that women are indeed underestimating men's true commitment when they show skepticism, and therefore the presence or absence of relationship-enhancing behaviors may not reflect actual differences in a man's degree of commitment. Instead, the behaviors may reflect commitment that is already present. To put it in signal detection terms, women's default commitment-skepticism may reflect a conservative criterion that causes them to “miss” the presence of genuine commitment signals. Only when the signal is strengthened by the presence of relationship-enhancing behaviors will it meet women's high threshold for

detection. This means that imagining the behaviors doesn't change men's self-reported commitment because men already know they are committed, whereas women require those behaviors to relax their skepticism.

The design of Study 1 does not allow us to test these two possible explanations, but it does provide compelling evidence that the commitment-skepticism bias is not rigid. Just as it responds to women's risk of conception (Cyrus et al., 2011), it yields when faced with contradictory evidence.

But what, exactly, is considered "evidence" of commitment? Do men and women perceive the same relationship behaviors as equally diagnostic evidence of commitment? Based on EMT, we predict that women have a higher threshold than men when it comes to how much evidence is necessary to believe their partner is committed. In Study 1, we intentionally exposed participants in the behavior condition to behaviors that were pre-tested to be highly indicative of commitment. EMT makes predictions about decisions made under uncertainty, and this behavioral evidence reduces some uncertainty. Study 2 tries to pinpoint where the criterion shift for commitment certainty occurs. We predict that more behavioral evidence is needed to reach women's "commitment threshold" than men's.

Study 2

Overview

To compare men and women's commitment thresholds, we developed a list of behaviors that could be used to signal commitment. The behaviors varied in how "convincing" they were, with some being easy to fake. Participants read the behaviors in ascending order of commitment strength while imagining that the behaviors were performed by their romantic partner. Participants indicated at what point they would feel certain about their partner's commitment to them, and that point represented the participant's commitment threshold. We predicted that women would have a higher threshold for commitment certainty than men.

Materials and Methods

Participants

A total of 120 participants were recruited from MTurk. After excluding non-heterosexual participants (using the same criteria as Study 1), participants over the age of 34, and those who failed an attention-check measure (described below), our final sample had 40 men and 36 women ($M_{\text{age}} = 26.14$; $SD_{\text{age}} = 4.51$). Participants received 20 cents for participating.

Procedure

After providing informed consent, participants read the following instructions:

In this survey, please imagine that you've been dating someone for 2 months. The following pages will each display a behavior you should imagine your dating partner doing. Imagine these behaviors are happening in order: First your partner does the behavior on page 1, then your partner does the behavior on page 2, after that your partner does the behavior on page 3... And so on.

Your task is to decide if your partner is committed to you, based on his/her behavior. If the first behavior does not make you certain of your partner's commitment, then click "no" below that behavior and proceed to the next one. Proceed until you feel absolutely certain that your partner is truly committed to you. Once you feel certain your partner is committed, click "yes."

There is no rule for what it means to be "truly committed." Go by whatever feels right to you. Select the number 3 below to show that you understand these instructions.

The last sentence served as a quality control measure, as participants' responses indicated whether they had paid attention to the instructions. We only analyzed the data of participants who selected the correct number.

Following the instructions, participants saw up to nine behaviors, one presented per survey page. Each page would display a behavior, followed by two answer options: "Yes, my partner is definitely committed to me," and "No, I'm not absolutely certain of my partner's commitment."

Selecting "Yes" would terminate the task, causing the survey to skip the remaining behaviors and proceed immediately to a final set of demographic questions. Participants' commitment threshold score was the number of behaviors they viewed before selecting "Yes." If a participant still said "No" for the ninth and final behavior, they were given a score of 10.

The behaviors were selected based on a pilot test ($n = 47$) in which male and female participants recruited via MTurk were asked to list three types of commitment behaviors that could be performed with a romantic partner of two months. We defined commitment behaviors as "behaviors people could perform to convince their romantic partner that they're committed to that person and the relationship." The three categories were low commitment (defined as "behaviors you could do to make your romantic partner believe you're committed, when the truth is that you aren't strongly committed to your partner (i.e., 'easy to fake' behaviors)"), moderate commitment ("behaviors you could do to make your romantic partner believe you're committed, when the truth is that you're moderately committed to your partner"), and high commitment ("behaviors you could do to make your romantic partner believe you're committed, and the truth is that you're definitely strongly committed to your partner"). We selected behaviors that were frequently listed within a single category by both male and female participants. We arranged the behaviors to appear in ascending degrees of commitment. They were:

1. Your partner gives you a small gift.
2. Your partner texts you occasionally.
3. Your partner takes you on frequent dates.
4. Your partner changes his/her relationship status on Facebook to "in a relationship" with you.
5. Your partner wants to go on a vacation with you.
6. Your partner introduces you to his/her family.
7. Your partner asks you to move in with him/her.
8. Your partner proposes marriage.
9. Your partner shares all of his/her assets with you.

Results and Discussion

Women required more behaviors ($M = 4.47$, $SD = 2.75$) to be certain of a partner's commitment than men did ($M = 3.30$, $SD = 2.32$), $t(74) = 2.01$, $p = .048$, $d = .46$. The difference remains significant with older participants included in the sample, $t(102) = 3.53$, $p = .001$, $d = .70$. In other words, as predicted, women have a higher threshold for certainty of a partner's commitment than men do.

General Discussion

The goal of our research was to test the functional flexibility of women's commitment-skepticism bias. We predicted that the bias would be responsive to men's behavior. In Study 1, women were not skeptical of a man's commitment if that man had engaged in multiple commitment-signaling behaviors. We intentionally chose behaviors that were highly indicative of commitment, and these behaviors not only reduced the bias, but even reversed it. This shows the conditional nature of women's evolved mating cognitions, such that they shift away from negative responses (in signal detection terms) when faced with diagnostic evidence of commitment. However, the system would be flawed if it responded to any relationship-enhancing behavior as evidence of commitment. Therefore, in Study 2 we compared the sensitivity of this system in men and women, predicting that women's system would require more evidence (i.e., a stronger signal) than men's before switching from a negative response to a positive one. We asked participants to imagine their romantic partner engaging in a series of behaviors that became increasingly indicative of commitment over time. As predicted, women required more behavioral evidence to be certain of a partner's commitment than men did.

Our theory is that the commitment-skepticism bias in women is inherently flexible; it will not persist in the face of contradictory evidence (i.e., evidence that a man is indeed committed). If the bias were to persist despite clear evidence of actual commitment intentions from a potential (or current) partner, this would be maladaptive for women. There is evidence that women see "good husbands" as a limited resource for which they must compete (Eichenbaum and Orbach, 1987, as cited in Bleske and Shackelford, 2001), and if committed men are indeed valuable, then a woman who "misses" such a partner (a false negative error) is facing a costly loss. Women's decision system is carefully calibrated to respond to evidence of commitment; the priority is to avoid false positives, but probable misses are also minimized. In signal detection terms, women, relative to men, require a stronger signal of commitment before shifting from a negative to a positive response.

Future directions and conclusion

Our research suggests that relationship-enhancing behaviors are one contextual cue that may lessen the commitment-skepticism bias. The duration of a relationship may be another important moderating factor. The commitment-skepticism bias is probably strongest during early courtship between a man and woman, at which time the likelihood of actual commitment on the man's part may indeed be quite low. However, as early acquaintance develops into a relationship, women may begin to relax their skepticism. The simple cue of relationship duration may be enough to reduce or even eliminate the bias, because the mere fact that the two are in an ongoing relationship evinces the male partner's

interest in a long-term connection. In this case, the current duration of the relationship may indeed be a valid cue of both partners' commitment intentions. It is also possible that duration effects will be moderated by the presence or absence of specific commitment-implying behaviors as well, given the results of the present research.

It is also interesting to note that men showed some skepticism of women's commitment, relative to women's self-ratings, in our pilot study and Study 1. This pattern was also observed by Cyrus et al. (2011) and is worth investigating in future research.

Lastly, an alternative explanation for Study 1's interaction between sex and behavior condition—specifically, that only women were influenced by the presence of commitment behavior—is that women are more accurate than men when perceiving social behavior. This explanation is consistent with past research showing that women decode interpersonal cues more accurately than men (e.g., Ambady, Hallahan, and Rosenthal, 1995; Hall, 1984). Although this interpretation remains possible, the findings of Study 2 support the conclusion that women's perceptions of partner commitment are more sensitive to behavioral cues than are men's perceptions.

To conclude, the current research replicates the existence of a commitment-skepticism bias in women while also showing that the bias is responsive to men's behavior, with behavior being a useful signal of commitment probability. This contributes to the growing literature on adaptive cognition that is sensitive to contextual shifts in risks and opportunities (e.g., Park, Schaller, and Crandall, 2007; Schaller, 2011; Schaller et al., 2007).

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