

**Communication as a Moderator of the Interplay between
Newlyweds' Sexual and Relationship Satisfaction**

by

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ABSTRACT

I examined reciprocal contemporaneous and time-lagged associations between marital and sexual satisfaction in heterosexual newlywed couples ($N = 189$), and whether positive (empathy, perspective taking) or negative (e.g., hostility, insensitivity) communication indicators moderated this association. Multilevel modeling indicated that sexual and relationship satisfaction co-varied, and that sexual satisfaction predicted increases in marital satisfaction, but the opposite was not true. Contemporaneously, good quality communication strengthened the positive association between marital and sexual satisfaction as the outcome, but did not moderate the association when marital satisfaction was the outcome. Communication quality did not interact with sexual satisfaction to predict changes in marital satisfaction, but did interact with marital satisfaction to predict sexual satisfaction. A cross-over interaction suggested that marital satisfaction predicted increases in sexual satisfaction when communication quality was positive, but declines when communication quality was less positive. Results highlight the importance of the sexual relationship to marital satisfaction in early marriage.

Keywords: sexual satisfaction; marital satisfaction; communication; longitudinal

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INTRODUCTION

Today, more than ever before, quality of the sexual experience and sexual expression are of elemental importance to most people (Byers, 2011). How people feel about their sexual relationship is one of the most important components of marital relationships, and it is critical to relationship satisfaction (for a review see Christopher & Sprecher, 2000; Schwartz & Young, 2009). Societal expectations about having a satisfying and fulfilling sex life may be especially salient for newlyweds; however, sexual relationships are not always satisfying (Aubin & Heiman, 2004). Sexual dysfunction affects many marriages (Lewis et al., 2004), and sexual dissatisfaction and dysfunction are associated with declines in couples' marital well-being (McCarthy, 2003). Researchers have made some headway in understanding sexuality in close relationships since Terman sparked scholarly interest in the 1930s, but sexual functioning remains one of the most neglected subjects in the relationship literature. There are few longitudinal investigations, and those that exist have yielded inconsistent findings. Further, little is known about what factors might moderate associations between sexual and relationship satisfaction (Christopher & Kisler, 2004). For example, the relational context, and specifically the quality of communication, may change the importance of sexual satisfaction for marital satisfaction, and vice versa. Understanding the causal nature of the association between sexual and relationship satisfaction and whether the relational context moderates this association could add to our understanding of how relationships develop over time, and who goes on to have satisfying relationships.

Sexual Functioning and Relationship Quality in Marriage

Much of the research on sexuality in close relationships focuses on sexual frequency (i.e., coital frequency), which is associated with sexual satisfaction and relationship satisfaction. Couples who have more frequent sexual intercourse are generally more sexually satisfied and happier in their marriages compared to those who have sexual intercourse less frequently (e.g., Bozon, 2001; Richters, Grulich, Visser, Smith, & Rissel, 2003). Cross-sectional studies suggest that sexual frequency decreases with age and relationship duration (e.g., Call, Sprecher, & Schwartz, 1995; Gossmann,

Mathieu, Julien, & Chartrand, 2003), and the association between sexual frequency and sexual satisfaction weakens over time (e.g., Laumann, Gagnon, Michael, & Michaels, 1994), as does the association between sexual and relationship satisfaction (e.g., Byers, 1999). Given that the links between sexual and relationship satisfaction seem to be strongest in newer relationships for younger individuals, and that sexual frequency is highest for newlyweds (Call, Sprecher, & Schwartz, 1995), understanding the longitudinal associations between sexual and relationship satisfaction in this early stage of marriage may be critical.

Theoretically, there are reasons to expect that sexual satisfaction will lead to greater satisfaction in relationships generally, but the converse may also be true and marital satisfaction may lead to mutually satisfying sexual relations. Social Exchange Theory (SET) suggests that relationship satisfaction results when the overall profits (rewards minus costs) in a relationship surpass the expectations that individuals have about the profits they should receive (Sprecher, 1998). Given that spouses view sexual satisfaction as one of the most important components of a satisfying relationship, it seems reasonable that a rewarding sexual relationship should contribute to greater overall relationship satisfaction. Positive interpersonal exchanges between members of the couple lead to relationship satisfaction, and sexual interactions are one type of interpersonal exchange. Lawrance and Byers (1992; 1995) proposed that sexual satisfaction also results from a balance of costs and rewards. In an extension of SET, they developed the Interpersonal Exchange Model of Sexual Satisfaction (IEMSS), which originally focused exclusively on sexual aspects of the relationship but was subsequently revised to explain the association between relationship and sexual satisfaction (Byers, 1999; Lawrance & Byers, 1995). According to the IEMSS, there are four components of the relationship that affect sexual satisfaction: the ratio of sexual rewards (e.g., pleasure during sex) to costs (e.g., engaging in sex when it is not desired), the comparison of costs and rewards to expectations, perceived equality of costs and rewards between partners, and non-sexual aspects of the relationship. Thus, although the specific qualities of the sexual relationship may have considerable effect on partners' sexual satisfaction, other aspects of their relationship do play a role. If individuals are happy with their relationship generally, the emotional connection they have established in the non-sexual

areas of their relationship may be brought in to and affect the quality of their sexual relationship. Combined, these two related theoretical frameworks suggest that there may be reciprocal causal associations between sexual and relationship satisfaction.

Despite the well documented positive association between sexual satisfaction and marital satisfaction, there has been surprisingly little empirical investigation of the causal nature of this association, even when studies have included longitudinal assessment of marital and sexual satisfaction (Edwards & Booth, 1994; Henderson-King & Veroff, 1994). The results from the few longitudinal studies also appear to yield inconsistent findings. For example, in a study of young college students (Sprecher, 2002), there was no causal association between sexual and relationship satisfaction over six months. Byers (2005) tested the competing theories of IEMSS and general SET and found that sexual satisfaction did not predict changes in relationship satisfaction and relationship satisfaction did not predict changes in sexual satisfaction in an 18-month follow-up with mostly married individuals who ranged in age from 23 to 61. However, post-hoc analyses revealed that in the sub-group of individuals whose relationship satisfaction was on a downward trajectory, sexual functioning drove changes in relationship quality, and in the subgroup of individuals whose sexual relationship was on an upward trajectory, relationship satisfaction drove changes in sexual satisfaction. Conversely, in a 10-year longitudinal study on established married couples, sexual functioning led to changes in marital functioning and marital stability (Yeh, Lorenz, Wickrama, Conger, & Elder, 2006). Yeh and colleagues examined cross-lagged path models with five waves of data over 10 years that indicated that sexual dissatisfaction predicted subsequent marital dissatisfaction (and marital instability), but marital dissatisfaction did not predict subsequent declines in sexual satisfaction. This suggests that sexual functioning drives marital satisfaction, but that the opposite is not true, at least in these long-term committed relationships. In summary, the evidence for a causal link between sexual and relationship satisfaction is mixed. However, the studies that yielded null findings tended to have relatively short follow-up periods (e.g., 6 to 18-months), assessed only residual change from baseline to one follow-up data point, and focused on relatively small (e.g., 87 to 101 participants) samples of dating couples or had very diverse samples in terms of age and relationship length. In contrast, the study by Yeh and colleagues that seems to clearly

support a causal path from sexual functioning to relationship satisfaction included a 10-year follow-up with five waves of data and focused on a large ($N = 283$) established married sample.

Relationship Context as a Moderator of the Association between Sexual and Relationship Satisfaction

Despite the inconsistent findings on the causal nature of the association between sexual and relationship satisfaction, the two are clearly intertwined. Although the methodological differences in longitudinal studies of the causal link between sexual and marital satisfaction may provide one explanation for the disparate findings, another explanation may be that important moderators may be affecting the nature of the association. Specifically, non-sexual dyadic factors such as communication quality may play a role. The quality of couples' general communication predicts increases in relationship satisfaction (e.g., Byers, 2005; Gottman, Coan, Carrere, & Swanson, 1998; Rogge & Bradbury, 1999), and in sexual satisfaction (e.g., Byers, 2005; Markman, Renick, Floyd, Stanley, & Clements, 1993). Moreover, good general couple communication is positively associated with couples' intimate communication, that is discussion of sexual behaviour including likes and dislikes (Cupach & Comstock, 1990; MacNeil & Byers, 1997; Oattes & Offman, 2007), which is also positively associated with relationship and sexual satisfaction (e.g., Purnine & Carey, 1997).

In addition to leading to sexual and relationship satisfaction, the quality of communication between couples may also be an important moderator. For example, when spouses are in a relationship characterized by good quality communication, they build intimacy, closeness, and connection, which may make up for any lack of intimacy, closeness, and connection in their sexual interactions and therefore buffer their relationship satisfaction from detrimental effects. The opposite may also be true; couples who have difficulty understanding one another and who lack harmony in their relationship may not experience less satisfying relationships generally if they are able to achieve physical connection and intimacy in their sexual relationship. Thus, couples who strengthen their connection through good communication generally or through a satisfying sexual relationship may not experience significant declines in relationship satisfaction—even if there is a lack in one domain. In support of this notion, Litzinger

and Gordon (2005) found that good general communication weakened the association between sexual and marital satisfaction. In other words, having good general communication buffered the negative effects of sexual dissatisfaction on marital satisfaction and vice versa. However, this study was cross-sectional so it is unclear if this buffering effect extends to longitudinal associations.

Current Study

The first purpose of this study was to investigate whether sexual satisfaction predicted marital satisfaction, or whether marital satisfaction predicted sexual satisfaction over two years in newlywed heterosexual couples. The second purpose was to examine whether indicators of communication quality such as spouses' empathy, perspective taking, and hostile social behaviour moderated these associations. Newlyweds were the focus in this study because the association between sexual and relationship satisfaction is strongest in newer relationships and in younger couples (for review see Christopher & Kisler, 2004), and all couples were at a similar developmental stage in their relationships, which reduced uncontrolled sources of demographic variability.

Given the inconsistent findings regarding longitudinal associations between sexual and marital satisfaction I did not make strong predictions about directionality of the causal link. However, I speculated that evidence for reciprocity might emerge. In other words, given that couples view sexual satisfaction as one of the most important components of a satisfying relationship, it follows that a rewarding sexual relationship will contribute to overall relationship satisfaction. In accordance with SET, a positive sexual relationship may increase spouses' feelings of closeness and intimacy that may extend into other areas of the relationship. Specifically, positive emotions generated in the sexual relationship may be associated with the partner and spill over into other areas of the relationship resulting in global relationship satisfaction. Feeling sexually satisfied may also increase the likelihood that spouses will show affection for one another (e.g., kissing, cuddling) in non-sexual situations, which may in turn increase overall feelings of relationship satisfaction.

I also expected that global relationship satisfaction might contribute to sexual satisfaction, as suggested by IEMSS. If individuals are happy with their relationship

generally, the emotional connection they have established in the non-sexual areas of their relationship may extend to sexual intimacy and connection. This is akin to sentiment override (Weiss, 1980) in that the global feelings about couples' relationships may influence the way in which they evaluate the specific components (i.e., sexual satisfaction). Therefore, when people are generally satisfied with their relationship they may evaluate the qualities of the sexual relationship more positively, and when people are less satisfied with their relationship generally, they may evaluate the sexual relationship more negatively. Another possibility is that maritally satisfied spouses may behave in ways that create a more mutually satisfying sexual relationship. For example, happily married spouses may self disclose about what they enjoy and desire in their sexual relationship and create opportunities for their partner to talk about their preferences and desires. Likewise, maritally happy spouses may be more willing to engage in new or partner preferred sexual behaviours than less maritally happy spouses. Thus, the feelings that people have about their relationship overall may affect their sexual relationship in multiple and complex ways.

I also investigated whether communication quality moderated contemporaneous and time-lagged within spouse associations between sexual satisfaction and relationship satisfaction. In their cross-sectional study, Litzinger and Gordon (2004) found that constructive communication buffered the deleterious effects of sexual dissatisfaction on marital quality and vice versa. However, their assessment of communication focused only on constructive mutual communication patterns in the context of relationship conflict, and thus an assessment of negative communication behaviour and behaviour outside the context of conflict was absent. In this study, I built on the work of Litzinger and Gordon by assessing general positive and negative indicators of communication quality. Specifically, self- and partner-reported empathy and perspective taking are factors that underlie successful communication in couple's relationships across multiple domains (in addition to conflict), and therefore may reflect more general communication. Empathy and perspective taking have been linked to good relational communication (Davis, 1994) and perspective taking affects the quality and meaningfulness of communication (Schober, 1998). For example, when individuals engage in perspective taking when framing their own message, others more easily understand them (Krauss &

Fussell, 1991). I also assessed perceptions of partner's hostile social behaviour in the relationship (a negative indicator of communication quality; e.g., insensitivity, ridicule, etc.), which is not necessarily tied to conflict in the relationship and thus may represent more subtle or common types of negative relationship behaviour.

Together, the presence of positive and absence of negative communication factors promote intimacy and connection and provide a sense of mutual understanding. Thus, I expected that having more empathy and perspective taking and less negative social behaviour would buffer negative effects of sexual dissatisfaction on marital satisfaction, or would buffer negative effects of marital dissatisfaction on sexual satisfaction. In other words, I predicted that when spouses reported good quality communication, sexual dissatisfaction would be less likely to lead to relationship dissatisfaction than when spouses reported less positive communication quality. When couples have good quality communication characterized by mutual understanding, a tendency to take each other's perspective, and relatively low levels of negative behaviours including insensitivity, hostility, and ridicule, they maintain closeness and connection and thus dissatisfaction in the sexual relationship may play a less detrimental role in general feelings about the relationship. Conversely, disappointment with the relationship generally may not be as detrimental to sexual satisfaction when couples have good quality communication. When spouses understand each other and are able to take their partner's point of view, they may be more attuned to the likes and dislikes of their partner in the sexual domain, so they may be able to maintain a more satisfying sexual relationship despite dissatisfaction with other domains of their relationship. When spouses have poor communication, sexual and relationship satisfaction may be more strongly linked because without the benefit of good quality communication, the sexual relationship may be the most salient indicator of the health of the relationship more generally. Thus, if one or both spouses are sexually dissatisfied, this may translate to corresponding dissatisfaction with the relationship overall. Conversely, if spouses have poor communication, negative thoughts and feelings about their relationship may be ignored and conflict poorly managed, which may foster resentment and decrease the likelihood of engaging in sexual activities, or the likelihood of experiencing mutually satisfying sexual activities.

METHOD

Participants

Participants were 189 heterosexual engaged couples living in the Metro Vancouver area. At T1, 118 (62.4%) couples were cohabiting and relationships averaged 4.13 years ($SD = 2.86$). By Time 2 (T2; six months later) couples had been married an average of 3.55 months ($SD = 2.52$). At T1, husbands averaged 29.26 years of age ($SD = 4.87$) and 16.28 years of education ($SD = 3.10$), and their average annual income ranged from \$30,000 to \$39,999. Wives averaged 27.46 years of age ($SD = 4.20$) and 16.68 years of education ($SD = 2.40$), and their average annual income ranged from \$20,000 to \$29,999.

Of the husbands, 75% were Caucasian, 15% were Asian, 3% were Indo-Canadian, 2% were Middle-Eastern, and 5% identified as “other.” Of the wives, 71% were Caucasian, 19% were Asian, 6% were Indo-Canadian, 1% were First Nations, and 3% identified as “other;” 20% of the couples were interracial.

Procedure

The Simon Fraser University research ethics board approved all procedures. Couples were recruited through (a) advertisements in local newspapers, electronic bulletin boards, and community notice boards, (b) bridal shows, (c) announcements mailed to local religious organizations and organizations offering premarital education, (d) print and television media coverage, and (e) word of mouth. A flowchart describing couple participation is in Figure 1. Interested individuals ($N = 617$) contacted the lab and one member of the couple ($n = 493$) completed a 15-minute interview by telephone or email to determine eligibility. Eligibility criteria included planning to marry within six months of Time 1 (T1), entering into a first marriage, being 18-45 years old, English fluency, having no children, and living in the metro Vancouver area. Of the couples who were screened for eligibility, 256 were ineligible and 237 were eligible. Of the remaining couples who contacted the lab but who were not screened, 94 were not screened despite repeated attempts to contact by lab staff and 30 contacted us after we had completed recruitment for the study and did not complete the screening interview.

Following the screening interview, both members of the couple received an email with information about the study and an electronic version of the consent form. Each email invitation for T1 through T5 included a link to the online questionnaires (hosted on a secure university website), a unique ID number, and a password to access the questionnaires. At T1, participants again received a copy of the consent form as an electronic attachment and after logging on to the online questionnaires, they read the informed consent form and indicated their consent to participate in the study by clicking a radio button. Informed consent was not repeated at each questionnaire phase, but participants were reminded of their confidentiality and right to withdraw participation at each phase subsequent to T1. Participants were asked to complete their questionnaires in private and not to discuss the questions or their responses with their partners.

Of the 237 eligible couples who agreed to participate, 16 subsequently decided they were no longer interested and the remaining 221 were sent T1 questionnaires approximately three months prior ($M = 3.03$, $SD = 1.08$) to their wedding date, and then every six months thereafter (T2 – T5) yielding five waves of data. Of the 221 couples, 202 wives and 198 husbands completed at least some of the T1 questionnaires. Compared to eligible couples ($n = 198$) who completed at least some T1 questionnaires, eligible couples who did not complete at least some T1 questionnaires (including those who did not receive T1 questionnaire links) ($n = 39$) were not different on ethnicity, age, relationship length, duration of cohabitation, or the screened partner's relationship satisfaction assessed in the phone screen interview (Kansas Marital Satisfaction Questionnaire; Schumm, Nichols, Schectman, & Grinsby, 1983).

Of the eligible couples who completed at least some T1 questionnaires ($n = 198$), 189 husband and wife pairs completed the questionnaires that are a focus of this study. Couples included in the current study ($n = 189$) did not significantly differ on ethnicity, age, relationship length, duration of cohabitation, or marital satisfaction (assessed in the phone interview; Schumm et al., 1983), from those who were eligible but not included ($n = 48$). Further, included couples ($n = 189$) did not differ from couples excluded because of missing data ($n = 9$) on demographic factors (i.e., age, education, ethnicity, relationship length, duration of cohabitation, or marital satisfaction).

Participants completed measures of marital satisfaction, sexual satisfaction, self- and partner-perspective taking and empathy, and partner hostile social behaviour at each time point. Spouses completed additional questionnaires over the two-year project and visited the laboratory twice (at T2 and T5) for in-person interviews and procedures that are not the focus of this study. Couples received \$75 at T1, \$100 at T2, \$50 at T3 and at T4, and \$150 at T5, which totalled \$425 for participation in all phases of the project.

Measures

Marital satisfaction. The Quality of Marriage Index (QMI; Norton, 1983) is a widely used six-item global measure of marital satisfaction. Participants were asked to “Please indicate how well the following statements describe you and your relationship.” Items one through five (e.g., “My relationship with my partner is very stable”) are rated on a 7-point Likert-scale, from 1 *Very Strong Disagreement* to 7 *Very Strong Agreement*, and the remaining item (“All things considered, how happy are you in your relationship?”) is rated on a 10-point scale from 1 *Very Unhappy* to 10 *Perfectly Happy*. Total scores are derived by summing items; higher values represent greater marital satisfaction and can range from six to 45. The QMI has good psychometric properties and reliably differentiates between maritally distressed and non-distressed couples. Spouses who score above 30 are considered maritally satisfied (Funk & Rogge, 2007). Over five waves of data, Cronbach’s alphas met or exceeded .90, averaging .95 for husbands and .94 for wives.

Sexual satisfaction. Respondents rated their sexual satisfaction on a single item, “Overall, how sexually satisfied do you feel?” on a 7-point Likert-scale item ranging from 1 *Not at all Satisfied* to 7 *Perfectly Satisfied*.

Communication-related variables. Participants completed measures of positive and negative communication quality: the Test of Negative Social Exchange (TNSE; Ruehlman & Karoly, 1991) and the Self and Other Dyadic Perspective taking Scales (SDPTS and ODPTS; Long, 1990). The TNSE is an 18-item scale that assesses spouses’ perceptions of the frequency of their partner’s negative social behaviour over the past month (e.g., “In the past month, my partner ignored my wishes or needs”). Participants were asked to “...indicate how often your partner acted these ways IN THE PAST

MONTH.” Items were rated on a 5-point Likert-scale ranging from 0 *Never* to 4 *Almost Every Day*. Total scores were computed by ... and can range from 0 to 72. Over five waves of data, Cronbach’s alphas met or exceeded .87, averaging .91 for husbands and .89 for wives.

The SDPTS consists of 13 items and the ODPTS consists of 20 items. The instructions to participants were to indicate how well items described themselves for the SDPTS, or their partner for the ODPTS. Items are rated on a Likert-scale ranging from 1 *Does not describe me (my partner) very well* to 5 *Does describe me (my partner) very well*. Subscale scores were computed by averaging the relevant items. The SDPTS yields two subscales: Self-rated empathy (e.g., “I always know exactly what my partner means”) and self-rated perspective taking (e.g., “I try to look at my partner’s side of a disagreement before I make a decision”). Similarly, the ODPTS yields two subscales: Partner-empathic understanding (e.g., “My partner does not sense or realize what I am feeling;” reverse scored), and partner-perspective taking (e.g., “My partner evaluates my motivation for doing something before he/she makes judgements about a situation”). Over five waves of data, Cronbach’s alphas met or exceeded .84 for self-empathy (averaging .90 for husbands and .91 for wives), and .85 for self-perspective taking (averaging .89 for husbands and .91 for wives). Cronbach's alphas met or exceeded .82 for partner empathy (averaging .85 for husbands and .90 for wives), and .86 for partner-perspective taking (averaging .92 for husbands and .93 for wives).

OVERVIEW OF DATA ANALYSIS

Hypotheses were tested with multilevel modeling using the Hierarchical Linear Modeling software program (HLM 6.08; Raudenbush, Bryk, & Congdon, 2004). I used a two-level model (repeated measures nested within individuals) that included husband and wife data simultaneously to take into account the dependence of the data (cf. Raudenbush, Brennan, & Barnett, 1995). Repeated measures (i.e., marital satisfaction, sexual satisfaction, and communication-related variables) were modeled at Level 1 to estimate intercepts (mean of outcome variable at T1) and trajectories of change (slopes) in the outcome. I standardized all Level 1 variables across waves prior to analyses,

which allows for the interpretation of the Level 1 coefficients as standardized betas. Level 1 variables were group mean centered with the exception of time, which was weighted as zero at T1 and the number of months from T1 to each data point. All coefficients were modeled as random (Nezlek, 2001) unless model convergence was problematic, in which case specific coefficients were fixed, and this is noted in the text.

RESULTS

Descriptive Statistics and Preliminary Analyses

Means and standard deviations of study variables at all time points are in Table 1. Husbands and wives did not differ in marital satisfaction at T1, T2, T3, or T5, but husbands reported lower marital satisfaction than wives did at T4. At T1, 4.8% of husbands and 2.6% of wives scored in the maritally distressed range (i.e., 30 or lower on the QMI), and at the final data point (T5), which was approximately 19 months of marriage, 5.9% of husbands and 8.1% of wives scored in the maritally distressed range. Husbands and wives did not differ in sexual satisfaction at any time point. Husbands reported higher levels of partner hostile social behaviour than wives did at all time points. Husbands and wives did not differ in self- or partner-rated perspective taking or empathy at any time point. There were no demographic (i.e., race, religion, education, income, relationship length) differences in the main study variables at T1 for husbands or wives, with the exception of income. Husbands' income was negatively associated with their marital satisfaction ($r = -.22$), self- ($r = -.24$) and partner-empathy ($r = -.19$), and self-perspective taking ($r = -.16$), and wives' income was negatively associated with their marital satisfaction ($r = -.16$; all $ps < .05$). However, income was not a significant cross-level moderator of trajectories of sexual or marital satisfaction.

Average correlations across five waves of data among main study variables are in Table 2. For husbands and wives at each time point, sexual satisfaction and marital satisfaction were positively associated; sexual and relationship satisfaction were positively associated with self- and partner-perspective taking and empathy, and negatively associated with partner hostile social behaviour. All correlations were

significant at each time point with only one exception: Husband sexual satisfaction and self-perspective taking were not associated at T5.

Trajectories of Sexual and Relationship Satisfaction and Communication Quality Over Two Years

In the first set of analyses, I examined whether there was linear change in any of the variables of interest using the following equations:

$$\text{Level 1} \quad Y_{ij}(\text{Outcome}_{(T)}) = \beta_{0j}(\text{Husband}) + \beta_{1j}(\text{Wife}) + \beta_{2j}(\text{Husband Time}_{(T)}) + \beta_{3j}(\text{Wife Time}_{(T)}) + r_{ij}$$

$$\text{Level 2} \quad \beta_{0j}(\text{Husband Intercept}) = \gamma_{00} + \mu_{0j}$$

$$\beta_{1j}(\text{Wife Intercept}) = \gamma_{10} + \mu_{1j}$$

$$\beta_{2j}(\text{Husband Time}) = \gamma_{20} + \mu_{2j}$$

$$\beta_{3j}(\text{Wife Time}) = \gamma_{30} + \mu_{3j}$$

where Y_{ij} is the outcome of interest for couple j at time i ; β_{0j} and β_{1j} represent the intercept (the mean of the outcome at T1 for husband and wife respectively); β_{2j} and β_{3j} are the rates of linear change in the outcome for husband and wife j respectively (i.e., the association between time and the outcome); and r_{ij} is the residual variance in repeated measurements for individual j , which is assumed to be independent and normally distributed.

Spouses' sexual satisfaction (Husbands: $\beta = -.18, t(188) = -2.61, p = .01$; Wives: $\beta = -.25, t(188) = -4.63, p < .001$) and marital satisfaction (Husbands: $\beta = -.88, t(188) = -4.02, p < .001$; Wives: $\beta = -.79, t(190) = -4.18, p < .001$) declined over time and thus time variables were retained in all subsequent analyses predicting sexual or marital satisfaction. Spouses' reports of self-perspective taking, partner empathy, and partner hostile social behaviour did not change systematically over time; however, these variables did vary around their mean over time. Conversely, spouses' self empathy (Husbands: $\beta = .06, t(188) = 2.18, p = .03$; Wives: $\beta = .04, t(188) = 2.19, p = .03$) became more positive and wives' partner-perspective taking ($\beta = -.06, t(190) = -2.56, p = .01$) became less positive over time.

Contemporaneous and Time-Lagged Reciprocal Associations between Sexual and Marital Satisfaction

The second set of analyses tested whether there were reciprocal associations between sexual and marital satisfaction. First, I tested whether sexual satisfaction predicted contemporaneous marital satisfaction and whether marital satisfaction predicted contemporaneous sexual satisfaction at Level 1 using the following general equation:

$$\text{Level 1} \quad Y_{ij}(\text{Outcome}_{(T)}) = \beta_{0j}(\text{Husband}) + \beta_{1j}(\text{Wife}) + \beta_{2j}(\text{Husband Time}_{(T)}) + \beta_{3j}(\text{Wife Time}_{(T)}) + \beta_{6j}(\text{Husband Covariate}_{(T)}) + \beta_{7j}(\text{Wife Covariate}_{(T)}) + r_{ij}$$

Results of the contemporaneous analyses are in Table 3 and indicated that sexual satisfaction and marital satisfaction covaried for husbands and for wives over time.¹ Specifically, increases in sexual satisfaction predicted contemporaneous increases in marital satisfaction and increases in marital satisfaction predicted contemporaneous increases in sexual satisfaction.

Second, to provide a test of causal associations, I conducted time-lagged multi-level analyses with six-month time lags (e.g., $T1 \rightarrow T2$, $T2 \rightarrow T3$, $T3 \rightarrow T4$, and $T4 \rightarrow T5$). This allowed me to examine whether sexual satisfaction at $\text{Time}_{(T)}$ predicted subsequent marital satisfaction at $\text{Time}_{(T+1)}$, or whether marital satisfaction at $\text{Time}_{(T)}$ predicted subsequent sexual satisfaction at $\text{Time}_{(T+1)}$. For example, to predict changes in subsequent marital satisfaction from earlier sexual satisfaction, the Level 1 equation would be as follows:

$$\text{Level 1} \quad Y_{ij}(\text{Marital Satisfaction}_{(T+1)}) = \beta_{0j}(\text{Husband}) + \beta_{1j}(\text{Wife}) + \beta_{2j}(\text{Husband Time}_{(T+1)}) + \beta_{3j}(\text{Wife Time}_{(T+1)}) + \beta_{4j}(\text{Husband Marital Satisfaction}_{(T)}) + \beta_{5j}(\text{Wife Marital Satisfaction}_{(T)}) + \beta_{6j}(\text{Husband Sexual Satisfaction}_{(T)}) + \beta_{7j}(\text{Wife Sexual Satisfaction}_{(T)}) + r_{ij}$$

To achieve model convergence, coefficients for sexual satisfaction and marital satisfaction as Level 1 predictors were fixed. In contrast to the contemporaneous analyses, the time-lagged analyses yielded a slightly different pattern. As shown in Table 4, spouses' sexual satisfaction at $\text{Time}_{(T)}$ predicted subsequent increases in marital satisfaction at $\text{Time}_{(T+1)}$, but marital satisfaction at $\text{Time}_{(T)}$ did not predict subsequent sexual satisfaction at $\text{Time}_{(T+1)}$.

Communication-Related Variables as Moderators of the Contemporaneous and Time-Lagged Associations between Sexual and Marital Satisfaction

In the third set of analyses, I examined whether sexual satisfaction and communication-related variables (at Level 1) interacted to predict changes in relationship satisfaction or whether marital satisfaction and communication-related variables (at Level 1) interacted to predict changes in sexual satisfaction in contemporaneous and time-lagged models.² First, I computed interaction terms at Level 1 by multiplying standardized scores (i.e., Marital Satisfaction X Communication-related variable and Sexual Satisfaction X Communication-related variable). The relevant interaction term and main effects were included in the contemporaneous and time-lagged Level 1 equations. I examined the interaction between each communication variable and sexual or marital satisfaction separately. I then graphed any significant interactions and conducted simple slopes analyses according to procedures outlined by Bauer and Curran (2005) using computer software developed by Sibley (2008).

First, I examined whether positive and negative indicators of communication quality interacted with sexual satisfaction at Level 1 to predict contemporaneous marital satisfaction. Coefficients for all interaction terms were fixed to achieve model convergence, and results are in Tables 5 to 7. Contrary to expectations, communication quality did not moderate the association between sexual satisfaction and contemporaneous marital satisfaction with one exception. As shown in Table 5 and illustrated in Figure 2, husbands' self-perspective taking moderated the association between sexual satisfaction and contemporaneous marital satisfaction. Both simple slopes were significant, and the positive association between sexual and marital satisfaction was stronger and more positive at higher levels of husbands' perspective taking than at lower levels of perspective taking. The same pattern emerged for husbands' partner-rated perspective taking as a moderator, but the interaction was only marginally significant.

Second, I examined whether positive and negative indicators of communication quality interacted with marital satisfaction at Level 1 to predict contemporaneous sexual satisfaction. Coefficients for all interaction terms were fixed to achieve model convergence, and results are in Tables 8 to 10. Communication quality, when measured

as self- or partner-rated empathy, self- or partner-rated perspective taking, or partner hostile social behaviour, moderated the association between marital satisfaction and contemporaneous sexual satisfaction as an outcome for husbands and wives. However, the nature of the interaction was contrary to prediction. As shown in Figures 3 and 4, there was a significant positive association between sexual and marital satisfaction when communication indicators were less positive, and this association became stronger and more positive when self- and partner-empathy or self- and partner-perspective taking were high, or partner hostile social behaviour was low. The simple slopes were significant in all cases.

Third, I examined whether positive and negative indicators of communication quality at Level 1 moderated the time-lagged association between sexual satisfaction and marital satisfaction as the outcome. Coefficients for sexual satisfaction, communication-related variables, and all interaction terms were fixed to achieve model convergence. Results of the time-lagged moderation analyses predicting subsequent marital satisfaction from sexual satisfaction are in Tables 11 to 13. Contrary to expectations, but consistent with the results from contemporaneous analyses, communication quality did not moderate the time-lagged association between sexual satisfaction and subsequent marital satisfaction.

Finally, I examined whether positive and negative indicators of communication quality at Level 1 moderated the time-lagged association between marital satisfaction and subsequent sexual satisfaction. Coefficients for marital satisfaction, communication-related variables, and all interaction terms were fixed to achieve model convergence. As shown in Tables 14 to 16, communication quality, with the exception of partner-perspective taking, moderated the time-lagged associations between marital satisfaction and sexual satisfaction only for wives. As with the contemporaneous analyses, the nature of the interaction was contrary to prediction. As shown in Figures 5 and 6, all simple slopes were non-significant; however, the pattern of the crossover interaction was consistent across the four indicators of communication quality. When wives' self-empathy, self-perspective taking, and partner-empathy were high, and partner-hostile social behaviour was low, marital satisfaction predicted increases in subsequent sexual

satisfaction, and when wives' indicators of communication quality were less positive, marital satisfaction predicted declines in subsequent sexual satisfaction.

DISCUSSION

Sexual and marital satisfaction co-vary (for review see Sprecher & Cate, 2004), but there is no consensus regarding the causal nature of this association, and relationship factors that could affect the longitudinal association have yet to be identified or examined. I investigated the contemporaneous and time-lagged reciprocal associations between sexual and relationship satisfaction and whether communication-related variables (i.e., self- and partner- empathy, self- and partner-perspective taking, and partner hostile social behaviour) moderated this association over two years in newlywed couples.

As expected and consistent with previous research, sexual satisfaction and marital satisfaction declined over two years, and sexual and marital satisfaction covaried over time. Results also indicated that sexual satisfaction predicted increases in subsequent marital satisfaction, but marital satisfaction did not predict increases in subsequent sexual satisfaction. Contrary to prediction, communication quality did not interact with sexual satisfaction to predict contemporaneous or subsequent marital satisfaction with one exception: As husbands' communication quality became more positive compared to less positive, the positive association between sexual satisfaction and contemporaneous marital satisfaction as the outcome became stronger. Communication quality did interact with marital satisfaction to predict contemporaneous and subsequent sexual satisfaction; however, the pattern of the interaction was contrary to prediction and somewhat counterintuitive.

The contemporaneous and time-lagged results showing main effects of sexual satisfaction on marital satisfaction are consistent with social exchange theory (SET) suggesting that positive sexual interactions make important contributions to spouses' general evaluations of relationship satisfaction (for review see Sprecher & Cate, 2004). Although there has been some suggestion in the literature that relationship satisfaction should lead to greater sexual satisfaction (e.g., Clark & Wallin, 1965; Lawrence & Byers,

1995), results of this study did not support this causal association. In other words, marital satisfaction did not have downstream effects on sexual satisfaction. Instead, it may be that positive experiences in the sexual domain served to increase spouses' feelings of closeness and intimacy, which then had lasting effects that extend into other areas of the relationship. For example, being satisfied in the sexual realm may lead to more affection and warmth in the relationship generally, which may increase spouses' feelings of global satisfaction with their relationship.

These results are consistent with the findings of Yeh and colleagues (2006), who demonstrated that sexual satisfaction leads to reliable changes in marital satisfaction (and stability). There are several possible reasons for the discrepancy between this study and previous studies that either find no association between sexual satisfaction and subsequent marital satisfaction, or find that marital satisfaction may affect subsequent sexual satisfaction. First, studies that yielded null findings did not include multiple waves of data and therefore associations between trajectories of change in sexual and relationship satisfaction could not be assessed, and follow-up periods were generally short. In this study, multiple waves of data from couples were obtained over two years and in the study by Yeh and colleagues (2006), multiple waves of data over ten years were obtained, which allowed for a more rigorous test of the causal nature of the associations than studies using only one relatively short follow-up data point. Second, previous studies often included only individuals in dating relationships or dating couples rather than couples in longer-term established relationships. It may be that the causal nature of the relation between sexual and relationship satisfaction differs depending on the duration and status of the relationship. For example, couples who find their new relationships sexually dissatisfying may exit quickly from these unions and thus such couples may not be represented in the research. Alternatively, since sexual frequency is significantly higher in newer relationships (e.g., Call et al., 1995) it may be that there is less variability in sex frequency and hence satisfaction in these developmentally younger couples; thus, associations with subsequent relationship quality may only emerge as frequency and sexual satisfaction begin to vary across couples.

Although marital satisfaction did not have main effects on subsequent sexual satisfaction, it did interact with communication quality factors to predict spouses'

contemporaneous sexual satisfaction and wives' time-lagged sexual satisfaction. I expected that there would be conditions under which the association between sexual and marital satisfaction changed; that is, I expected that good communication quality would buffer the negative effects of sexual dissatisfaction on marital satisfaction and the negative effects of marital dissatisfaction on sexual satisfaction, an expectation that was consistent with the cross-sectional findings of Litzinger and Gordon (2005). However, contemporaneously, spouses' better quality communication strengthened the already positive association between marital satisfaction and sexual satisfaction. In other words, the positive association between sexual and marital satisfaction was weakened when spouses saw themselves and partners as less empathic, less likely to take the other's point of view and saw their partner as more hostile, insensitive, and ridiculing. Thus, in contrast to what was expected, the positive association between sexual and relationship satisfaction was enhanced to the degree that relationships were characterized by factors that could be expected to lead to better communication and by a relative lack of negative social behaviour. In other words, positive features of communication potentiated the positive effects of a satisfying marriage rather than buffering negative effects.

There are several possible reasons for this apparent lack of consistency. First, in comparison to Litzinger and Gordon (2005), couples in this study were younger (husbands averaged 29.3 vs. 44.2 years and wives averaged 27.5 years vs. 42.2), childless (couples averaged two children in the Litzinger & Gordon study), beginning first marriages only, and in newer relationships (average relationship length 4.1 years in this study vs. 17.5 years). Thus, it may be that communication quality plays a different role in more developmentally mature marriages or marriages involving children, perhaps because relationship satisfaction becomes more multiply determined and spouses may change the criteria by which they make judgements about the quality of their marriages. Thus, resolving conflict constructively might compensate for a less than satisfying experience in another domain of the marriage, which in the case of the couples in Litzinger and Gordon was the sexual domain. It may also be that couples in longer-term marriages with children have different expectations about their sex lives and may view declines in sexual satisfaction and frequency as normative and less consequential for the marriage (Sprecher & Cate, 2004). However, when considering the younger and newer

couples in this study, disappointment in the sexual domain may be particularly salient and other positive features of the relationship may not be able to compensate in the face of strong unmet expectations for a satisfying sex life.

Second, in this study I assessed sexual satisfaction with a single face-valid item: “Overall, how sexually satisfied do you feel?” Litzinger and Gordon (2005) asked participants to indicate whether they felt that the standards in their sexual relationship were being met (e.g., “Both of us should get the same enjoyment out of having sex,” answered yes or no), which does not necessarily reflect sexual satisfaction. Finally, I assessed communication as empathy, perspective taking, and hostile social behaviour such as impatience, insensitivity, and ridicule, which was not necessarily in the context of conflict. Litzinger and Gordon (2005) assessed patterns of mutual constructive communication during conflict and did not assess self and partner behaviours separately. Thus, it is somewhat difficult to make direct comparisons between the findings of this study and those of Litzinger and Gordon.

The pattern of results was somewhat more complex when considering the time-lagged moderation analyses than the contemporaneous analyses, and they were only significant for wives. Although there were no main effects of marital satisfaction on changes in sexual satisfaction, communication quality did moderate the association between marital satisfaction and subsequent changes in sexual satisfaction. In no case were the simple slopes significant, but the interaction pattern suggested that when wives felt they were more empathic and understanding of their partner’s perspective, and viewed their partners as understanding of their perspective and unlikely to engage in hostile social behaviour, marital satisfaction led to greater sexual satisfaction. In contrast, when wives perceptions of self- and partner-rated perspective taking, self-rated empathy, and partner’s hostile social behaviour were less positive, wives’ marital satisfaction led to decreases in their sexual satisfaction. Although the finding that marital satisfaction leads to a more positive sexual relationship when communication quality is relatively good is consistent with the contemporaneous findings and with IEMSS theory, the finding that marital satisfaction leads to declines in sexual satisfaction when communication quality is relatively less positive is somewhat more difficult to explain.

Given that the simple slopes were not significant and that the findings are counter-intuitive, caution interpreting these results is warranted.

If pushed to speculate, one explanation might be that for women who are generally happy with their marriage but fail to experience sufficient levels of mutual empathy and understanding and experience their partners as somewhat critical and ridiculing, the lack of understanding and relatively hostile environment may lead these wives to be more passive in the sexual domain. In other words, because these wives are generally happy with their relationship, they may be motivated to act in ways that they believe will please their partner (e.g., engage in partner-preferred sexual behaviours). However, because they do not feel that they understand their partner or understood by their partner, they may feel vulnerable in the sexual realm and unwilling to be sexually assertive, which may increase the likelihood that they will adopt a more traditional sex script of female submission (and male dominance). Women who adopt the submissive sexual role experience less freedom and choice in their sexual relationships (i.e., decreased sexual autonomy) and lower sexual satisfaction (e.g., Sanchez, Kiefer, & Ybarra, 2006). On the other hand, women who are generally less maritally happy may not experience such a contrast effect between their global feelings of marital satisfaction and their more specific experiences of empathy and understanding and hostile social behaviour with their partner. In other words, because they are less happy in the marriage generally, the lack of mutual understanding may be more in line with their conceptualizations of the marriage. In this case, they may be less likely to go along with their partner's wishes in the sexual domain, particularly if they are not in line with their own, making them less likely to adopt a traditional sex script, and therefore less likely to experience the same declines in their feelings about their sexual relationship.

Strengths, Limitations, and Future Directions

This study has several notable strengths, but there are also caveats to consider when interpreting these results. First, sources of uncontrolled demographic variability were reduced by collecting data from couples who were at the same relationship stage (i.e., childless couples within a specific age range beginning first marriages). Further, a newlywed sample may be ideal because the links between sexual and relationship

satisfaction are strongest in newer relationships and in younger couples (for review see Christopher & Kisler, 2004). However, the restrictions on the sample may also render the results somewhat less generalizable, as couples at different stages of their relationship were not included. Second, although every effort was made to recruit an ethnically diverse sample and the sample was more diverse than in other marital research, non-Caucasian, lower income, and less educated participants are underrepresented (Statistics Canada, 2007). Furthermore, the couples in this study were not randomly selected from the local population of engaged couples, which may have resulted in selection biases.

Third, multiple assessments over two years of marriage were obtained and analyzed appropriately using multi-level modelling, which compares favourably to most other studies that included only one follow-up point. However, two years is a relatively short period in the life of a marriage and marital change is often only apparent three to four years into marriage (Karney & Bradbury, 1995). Thus, the magnitude of associations between sexual and marital satisfaction observed in this study may be underestimated, and longer follow-up periods will be required to fully understand the developmental trajectories of sexual and marital satisfaction and the role of communication. It may also be that shorter lags between follow-ups could provide a more accurate picture of how sexual and relationship satisfaction are related. Sprecher (2002) observed that sexual and relationship satisfaction may influence each other “almost simultaneously” (p. 195); therefore, associations may more clearly emerge when considering shorter time lags (cf. Poyner-Del Vento & Cobb, 2011).

Fourth, each spouse provided multiple measures of partner and self-reported communication quality; however, such reports can be subject to social desirability biases or other response sets (Arias & Beach, 1987). Therefore, in the future it will be valuable to obtain other measures of communication (e.g., observation of marital discussions). Researchers are beginning to examine couple’s discussions about their sexual relationship (e.g., Rehman et al., 2011), but this is largely absent from the literature and will be a critical next step to understanding how communication specific to the sexual relationship affects the association between sexual and relationship satisfaction.

Finally, sexual satisfaction was assessed with a single item on global sexual satisfaction that did not specifically ask the respondents to consider only their satisfaction

with their sexual relationship with the partner. Thus, the measure may have tapped not only relational components of sexual satisfaction, but also personal sexual satisfaction (e.g., Meston & Trapnell, 2005). The lack of specificity means that sexual satisfaction in this study may have reflected sexual satisfaction derived from solitary sexual activity (i.e., masturbation) or extra-dyadic sexual relationships in addition to sexual satisfaction derived from the primary marital relationship. Therefore, it will be important to include multifaceted measures of sexual satisfaction, and in particular evaluate satisfaction in the context of the relationship in future studies. Another fruitful avenue would be to explore cross-partner associations. Although this would be possible with data from this study, it was beyond the scope of this paper to explore such questions as whether wives' empathy and understanding moderated the links between their husbands' sexual and relationship satisfaction.

CLINICAL IMPLICATIONS AND CONCLUSIONS

Couples' relationship satisfaction plays a major role in psychological well-being, physical health, and longevity (e.g., Diener & Chan, 2011; Kiecolt-Glaser & Newton, 2001). Moreover, epidemiological estimates of the prevalence of sexual dysfunction are relatively high, at about 40-45% for women and 20-30% for men (Lewis et al., 2004). Overall, findings from this study suggest that there are direct effects of sexual satisfaction on subsequent marital satisfaction, and that the quality of communication does not affect this association. Moreover, although there were no direct effects of marital satisfaction on subsequent sexual satisfaction, communication quality did moderate the association between marital satisfaction and subsequent sexual satisfaction for wives, suggesting that it may be important to consider the relationship context.

Considering the high rate of divorce and the frequency of sexual and marital dissatisfaction experienced by couples who remain together, researchers need to understand the interactive role of various relationship factors so that clinicians are able to make informed decisions about how to prevent adverse marital outcomes or treat couples in distress. The results of this study underscore the importance of sexual satisfaction, and suggest that evaluation of sexual functioning and satisfaction may be critical for couples

seeking treatment for marital distress. Given that positive communication factors in marriage failed to compensate for a relative lack of sexual satisfaction this study also suggests that a focus on communication may not be sufficient to result in an improvement in marital quality for couples who are also experiencing sexual dissatisfaction. Furthermore, the results suggest that for couples who do present with sexual dissatisfaction, a focus on general marital dynamics may not lead to predictable downstream improvements in their sexual relationship.

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Footnotes

¹Demographic variables at Level 2 did not moderate the association between sexual and marital satisfaction with one exception. The contemporaneous association between wives marital satisfaction and sexual satisfaction as an outcome was stronger for couples in relationships of shorter duration ($\beta = .43, t(186) = 9.13, p < .001$) than for couples in relationships of longer duration ($\beta = .04, t(186) = 2.26, p = .03$). All contemporaneous analyses were re-run controlling for relationship length but as the pattern of results was comparable, I presented results without relationship length for simplicity.

²All contemporaneous and time-lagged moderation analyses were re-run with frequency of sexual activities in place of sexual satisfaction. Results of the reciprocal contemporaneous and time-lagged analyses of the association between sexual frequency and marital satisfaction and the contemporaneous moderation analyses were similar, although attenuated. However, the results from the time-lagged moderation analyses were slightly different. As with sexual satisfaction, communication quality did not moderate the association between sexual frequency and subsequent marital quality. However, in contrast to the time-lagged moderation analyses with sexual satisfaction, marital satisfaction predicted increases in sexual frequency when communication quality was less positive and this association was strengthened when communication quality was more positive.

Tables

Table 1

Means and Standard Deviations of Sexual Satisfaction, Marital Satisfaction, and Communication-Related Variables at Each Time Point

	Husbands					Wives				
	<u>Time</u>					<u>Time</u>				
	1	2	3	4	5	1	2	3	4	5
Marital										
<i>M</i>	41.13	41.55	41.01	39.32	39.76	41.66	41.56	41.29	40.46	40.11
<i>SD</i>	5.09	4.42	4.74	7.03	5.65	4.15	4.50	5.05	6.57	6.38
Sexual Satisfaction										
<i>M</i>	4.99	5.18	4.96	4.79	4.61	4.95	5.00	4.90	4.68	4.47
<i>SD</i>	1.62	1.43	1.34	1.48	1.55	1.53	1.42	1.48	1.61	1.67
Partner Hostile Social										
<i>M</i>	14.89	15.44	15.53	14.90	14.31	12.13	11.97	11.95	12.36	12.13
<i>SD</i>	9.06	10.38	10.56	10.43	10.59	8.26	8.41	9.25	9.29	8.97
Empathy										
<i>M</i>	3.72	3.76	3.80	3.85	3.90	3.75	3.80	3.88	3.86	3.85
<i>SD</i>	0.61	0.69	0.69	0.72	0.71	0.71	0.69	0.69	0.72	0.69
Perspective taking										
<i>M</i>	3.67	3.76	3.81	3.74	3.79	3.67	3.73	3.83	3.75	3.74
<i>SD</i>	0.72	0.73	0.79	0.79	0.81	0.81	0.83	0.85	0.88	0.86
Partner Empathy										
<i>M</i>	3.62	3.71	3.67	3.70	3.74	3.73	3.77	3.80	3.73	3.76
<i>SD</i>	0.71	0.73	0.75	0.76	0.79	0.77	0.85	0.89	0.90	0.88
Partner Perspective taking										
<i>M</i>	3.60	3.66	3.75	3.55	3.58	3.62	3.67	3.73	3.55	3.57
<i>SD</i>	0.71	0.72	0.71	0.79	0.80	0.76	0.86	0.89	0.92	0.90

Note. T1 $N = 189$ (except SS where $N = 175$).

Table 2

Average Correlations Among Sexual Satisfaction, Marital Satisfaction, and Communication-Related Variables Across All Time Points

	1	2	3	4	5	6	7
1. Marital Satisfaction	-	.38	-.53	.52	.32	.54	.54
2. Sexual Satisfaction	.34	-	-.31	.26	.19	.35	.35
3. Partner Hostile Social Behaviour	-.57	-.23	-	-.48	-.33	-.65	-.57
4. Empathy	.49	.27	-.51	-	.62	.62	.67
5. Perspective taking	.35	.25	-.43	.67	-	.42	.55
6. Partner Empathy	.57	.28	-.70	.67	.55	-	.83
7. Partner Perspective taking	.53	.31	-.66	.67	.60	.87	-

Note. Average correlations among husbands appear above the diagonal and average correlations among wives appear below the diagonal.

Table 3

Contemporaneous Reciprocal Associations Between Sexual Satisfaction and Marital Satisfaction

	<u>Husbands</u>			<u>Wives</u>		
	<u>Coefficient</u>	<u>SE</u>	<u>t-ratio</u>	<u>Coefficient</u>	<u>SE</u>	<u>t-ratio</u>
<u>→ Slope of Marital Satisfaction</u>						
Intercept	41.79	0.31	132.75***	41.74	0.30	139.70***
Time _(T)	-0.80	0.22	-3.66**	-0.56	0.18	-3.08**
Sexual Satisfaction _(T)	1.15	0.24	4.86***	1.27	0.22	5.76***
<u>→ Slope of Sexual Satisfaction</u>						
Intercept	5.05	0.11	46.48***	5.02	0.10	48.53***
Time _(T)	-0.11	0.07	-1.61	-0.20	0.05	-3.72***
Marital Satisfaction _(T)	0.40	0.07	5.74***	0.39	0.05	7.63***

Note. *df* = 188.

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

Table 4

Time-Lagged Reciprocal Associations Between Sexual Satisfaction and Marital Satisfaction

	<u>Husbands</u>			<u>Wives</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
<u>→ Marital Satisfaction_(T+1)</u>						
Intercept ⁺	42.08	0.36	115.39***	42.51	0.44	97.19***
Time _(T+1) ⁺	-1.12	0.24	-4.76***	-1.02	0.29	-3.55**
Marital Satisfaction _(T) ⁺	0.06	0.27	0.23	-0.48	0.32	-1.52
Sexual Satisfaction _(T) [^]	0.51	0.27	1.89 [†]	0.49	0.25	1.97*
<u>→ Sexual Satisfaction_(T+1)</u>						
Intercept [°]	5.22	0.12	44.47***	5.20	0.13	39.97***
Time _(T+1) [°]	-0.29	0.06	-4.63***	-0.33	0.07	-4.48***
Sexual Satisfaction _(T) [°]	0.10	0.06	1.77 [†]	-0.03	0.07	-0.48
Marital Satisfaction _(T) [§]	0.10	0.06	1.63	-0.10	0.07	-1.38

Note. ⁺df = 182; [^]df = 1272; [°]df = 181; [§]df = 1231.

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

Table 5

Self-rated Empathy or Perspective taking as Moderators of the Association Between Sexual Satisfaction and Contemporaneous Marital Satisfaction as an Outcome

	<u>Husbands' Marital Satisfaction</u>			<u>Wives' Marital Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
<u>Sexual Satisfaction X Empathy</u>						
Intercept ⁺	41.49	0.33	125.66***	41.74	0.28	146.88***
Time _(T) ⁺	-0.80	0.21	-3.80***	-0.57	0.17	-3.35**
Sexual Satisfaction _(T) ⁺	0.80	0.23	3.52**	1.12	0.20	5.68***
Empathy _(T) ⁺	1.18	0.23	5.06***	1.26	0.19	6.62***
Sexual Satisfaction x Empathy _(T) [^]	0.46	0.40	1.13	0.26	0.18	1.41
<u>Sexual Satisfaction X Perspective taking</u>						
Intercept ⁺	41.46	0.32	127.95***	41.69	0.29	142.99***
Time _(T) ⁺	-0.75	0.19	-4.01***	-0.42	0.15	-2.78**
Sexual Satisfaction _(T) ⁺	1.01	0.23	4.38***	1.18	0.21	5.67***
Perspective taking _(T) ⁺	0.39	0.18	2.22*	0.74	0.17	4.32***
Sexual Satisfaction x Perspective taking _(T) [°]	0.46	0.19	2.35*	0.18	0.17	1.08

Note. ⁺df = 188; [^]df = 1449; [°]df = 1450.

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

Table 6

Partner-rated Empathy or Perspective taking as Moderators of the Association Between Sexual Satisfaction and Contemporaneous Marital Satisfaction as an Outcome

	<u>Husbands' Marital Satisfaction</u>			<u>Wives' Marital Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
<u>Sexual Satisfaction X Partner Empathy</u>						
Intercept ⁺	41.37	0.34	122.86***	41.64	0.28	148.88***
Time _(T) ⁺	-0.75	0.19	-4.01***	-0.42	0.15	-2.78**
Sexual Satisfaction _(T) ⁺	0.64	0.24	2.66**	0.96	0.19	5.10***
Partner Empathy _(T) ⁺	1.62	0.21	7.60***	1.82	0.19	9.60***
Sexual Satisfaction x Partner Empathy _(T) [^]	0.12	0.35	0.36	-0.12	0.16	-0.74
<u>Sexual Satisfaction X Partner Perspective taking</u>						
Intercept ⁺	41.32	0.33	123.97***	41.59	0.29	141.58***
Time _(T) ⁺	-0.71	0.20	-3.45**	-0.36	0.16	-2.23*
Sexual Satisfaction _(T) ⁺	0.70	0.22	3.20**	1.01	0.20	5.01***
Partner Perspective taking _(T) ⁺	1.39	0.21	6.52***	1.59	0.21	7.52***
Sexual Satisfaction x Partner Perspective taking _(T) [^]	0.49	0.28	1.75 [†]	-0.12	0.17	-0.67

Note. ⁺df = 188; [^]df = 1449.

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

Table 7

Partner-rated Hostile Social Behaviour as a Moderator of the Association Between Sexual Satisfaction and Contemporaneous Marital Satisfaction as an Outcome

	<u>Husbands' Marital Satisfaction</u>			<u>Wives' Marital Satisfaction</u>		
	<u>Coefficient</u>	<u>SE</u>	<u>t-ratio</u>	<u>Coefficient</u>	<u>SE</u>	<u>t-ratio</u>
Intercept ⁺	41.29	0.34	120.42***	41.58	0.28	148.45**
Time _(T) ⁺	-0.67	0.21	-3.19**	-0.33	0.14	-2.40*
Sexual Satisfaction _(T) ⁺	0.69	0.22	3.11**	0.89	0.18	4.80***
Hostile Social Behaviour _(T) ⁺	-1.36	0.21	-6.33**	-1.96	0.21	-9.34***
Sexual Satisfaction x Hostile Social Behaviour _(T) [^]	-0.23	0.41	-0.56	0.30	0.19	1.56

Note. ⁺df = 188; [^]df = 1444.

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

Table 8

Self-Rated Empathy or Perspective taking as Moderators of the Association Between Marital Satisfaction and Contemporaneous Sexual Satisfaction as an Outcome

	<u>Husbands' Sexual Satisfaction</u>			<u>Wives' Sexual Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
<u>Marital Satisfaction X Empathy</u>						
Intercept ⁺	5.09	0.11	47.15***	5.04	0.10	48.52***
Time _(T) ⁺	-0.18	0.07	-2.74**	-0.23	0.05	-4.30***
Marital Satisfaction _(T) ⁺	0.39	0.07	5.39***	0.45	0.06	7.53***
Empathy _(T) ⁺	0.23	0.06	3.65**	0.08	0.06	1.43
Marital Satisfaction x Empathy _(T) [^]	0.17	0.03	5.73***	0.13	0.03	4.20***
<u>Marital Satisfaction X Perspective taking</u>						
Intercept ⁺	5.08	0.11	47.04***	5.03	0.10	48.41***
Time _(T) ⁺	-0.16	0.07	-2.45*	-0.22	0.05	-4.20***
Marital Satisfaction _(T) ⁺	0.40	0.07	5.66***	0.44	0.05	8.47***
Perspective taking _(T) ⁺	0.14	0.05	2.68**	0.10	0.06	1.61
Marital Satisfaction x Perspective taking _(T) [°]	0.16	0.04	3.75***	0.17	0.03	5.19***

Note. ⁺df = 188; [^]df = 1449; [°]df = 1450.

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

Table 9

Partner-Rated Empathy or Perspective taking as Moderators of the Association Between Marital Satisfaction and Contemporaneous Sexual Satisfaction as an Outcome

	<u>Husbands' Sexual Satisfaction</u>			<u>Wives' Sexual Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
<u>Marital Satisfaction X Partner Empathy</u>						
Intercept ⁺	5.08	0.10	48.46***	5.02	0.11	47.40***
Time _(T) ⁺	-0.14	0.07	-2.11*	-0.22	0.05	-4.14***
Marital Satisfaction _(T) ⁺	0.35	0.08	4.47***	0.42	0.07	6.32***
Partner Empathy _(T) ⁺	0.25	0.07	3.79***	0.10	0.07	1.51
Marital Satisfaction x Partner Empathy _(T) [^]	0.08	0.04	1.95 [†]	0.07	0.04	1.90 [†]
<u>Marital Satisfaction X Partner Perspective taking</u>						
Intercept ⁺	5.07	0.11	48.04***	5.02	0.10	48.52***
Time _(T) ⁺	-0.15	0.06	-2.28*	-.21	0.05	-3.99***
Marital Satisfaction _(T) ⁺	0.35	0.08	4.51***	0.39	0.07	5.88***
Partner Perspective taking _(T) ⁺	0.35	0.07	4.80***	0.20	0.07	2.98**
Marital Satisfaction x Partner Perspective taking _(T) [^]	0.15	0.05	2.87**	0.07	0.03	2.04*

Note. ⁺df = 188; [^]df = 1449.

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

Table 10

Partner-Rated Hostile Social Behaviour as a Moderator of the Association Between Marital Satisfaction and Contemporaneous Sexual Satisfaction as an Outcome

	<u>Husbands' Sexual Satisfaction</u>			<u>Wives' Sexual Satisfaction</u>		
	<u>Coefficient</u>	<u>SE</u>	<u>t-ratio</u>	<u>Coefficient</u>	<u>SE</u>	<u>t-ratio</u>
Intercept ⁺	5.05	0.11	47.20***	5.03	0.11	47.10***
Time _(T) ⁺	-0.12	0.07	-1.80 [†]	-0.22	0.05	-4.03***
Marital Satisfaction _(T) ⁺	0.41	0.07	5.64***	0.41	0.07	5.83***
Hostile Social Behaviour _(T) ⁺	-0.19	0.06	-3.18**	-0.10	0.07	-1.48
Marital Satisfaction x Hostile Social Behaviour _(T) [^]	-0.14	0.04	-3.43**	-0.05	0.02	-2.31*

Note. ⁺df = 188; [^]df = 1444.

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

Table 11

Self-Rated Empathy or Perspective taking as Moderators of the Time-Lagged Association Between Sexual Satisfaction and Subsequent Marital Satisfaction

	<u>Husbands' Marital Satisfaction</u>			<u>Wives' Marital Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
<u>Sexual Satisfaction X Empathy</u>						
Intercept ⁺	42.09	0.37	112.69***	42.59	0.45	95.09***
Time _(T+1) ⁺	-1.14	0.24	-4.73***	-1.07	0.29	-3.68**
Marital Satisfaction _(T) ⁺	0.04	0.28	0.14	-0.46	0.33	-1.41
Sexual Satisfaction _(T) [^]	0.46	0.26	1.77 [†]	0.45	0.24	1.85 [†]
Empathy _(T) [^]	0.23	0.22	1.08	0.31	0.19	1.62
Sexual Satisfaction x Empathy _(T) [^]	-0.16	0.31	-0.52	-0.25	0.27	-0.92
<u>Sexual Satisfaction X Perspective taking</u>						
Intercept ⁺	42.11	0.35	119.61***	42.58	0.43	98.50***
Time _(T+1) ⁺	-1.15	0.23	-5.00***	-1.07	0.29	-3.72***
Marital Satisfaction _(T) ⁺	0.09	0.27	0.33	-0.43	0.33	-1.29
Sexual Satisfaction _(T) [°]	0.47	0.26	1.84 [†]	0.42	0.23	1.77 [†]
Perspective taking _(T) [°]	0.11	0.21	0.52	0.31	0.20	1.54
Sexual Satisfaction x Perspective taking _(T) [°]	-0.35	0.24	-1.46	-0.34	0.22	-1.58

Note. ⁺df = 182; [^]df = 1263; [°]df = 1264.
[†]p < .10. *p < .05. **p < .01. *** p < .001.

Table 12

Partner-Rated Empathy or Perspective taking as Moderators of the Time-Lagged Association Between Sexual Satisfaction and Subsequent Marital Satisfaction

	<u>Husbands' Marital Satisfaction</u>			<u>Wives' Marital Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
<u>Sexual Satisfaction X Partner Empathy</u>						
Intercept ⁺	42.08	0.38	111.87***	42.55	0.45	95.48***
Time _(T+1) ⁺	-1.14	0.24	-4.76***	-1.04	0.29	-3.62**
Marital Satisfaction _(T) ⁺	0.02	0.31	0.05	-0.65	0.37	-1.73 [†]
Sexual Satisfaction _(T) [^]	0.44	0.25	1.81 [†]	0.44	0.25	1.76 [†]
Partner Empathy _(T) [^]	0.26	0.27	0.93	0.47	0.26	1.78 [†]
Sexual Satisfaction x Partner Empathy _(T) [^]	-0.11	0.35	-0.31	-0.10	0.27	-0.37
<u>Sexual Satisfaction X Partner Perspective taking</u>						
Intercept ⁺	42.05	0.38	111.62***	42.55	0.44	95.69***
Time _(T+1) ⁺	-1.12	0.24	-4.70***	-1.04	0.29	-3.57**
Marital Satisfaction _(T) ⁺	0.11	0.27	0.40	-0.66	0.36	-1.84 [†]
Sexual Satisfaction _(T) [^]	0.51	0.24	2.08*	0.42	0.27	1.58
Partner Perspective taking _(T) [^]	-0.07	0.18	-0.36	0.65	0.25	2.58*
Sexual Satisfaction x Partner Perspective taking _(T) [^]	-0.03	0.33	-0.10	-0.02	0.26	-0.09

Note. ⁺df = 182; [^]df = 1264.

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

Table 13

Partner-Rated Hostile Social Behaviour as a Moderator of the Time-Lagged Association Between Sexual Satisfaction and Subsequent Marital Satisfaction

	<u>Husbands' Marital Satisfaction</u>			<u>Wives' Marital Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
Intercept ⁺	42.06	0.36	115.57***	42.47	0.44	95.97***
Time _(T+1) ⁺	-1.08	0.23	-4.73***	-1.03	0.29	-3.62**
Marital Satisfaction _(T) ⁺	-0.07	0.30	-0.24	-0.57	0.39	-1.48
Sexual Satisfaction _(T) [^]	0.41	0.26	1.55	0.43	0.24	1.81 [†]
Hostile Social Behaviour _(T) [^]	-0.83	0.29	-2.89**	-0.61	0.30	-2.01*
Sexual Satisfaction x Hostile Social Behaviour _(T) [^]	0.02	0.35	0.06	0.11	0.22	0.51

Note. ⁺df = 182; [^]df = 1259.

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

Table 14

Self-Rated Empathy or Perspective taking as Moderators of the Time-Lagged Association Between Marital Satisfaction and Subsequent Sexual Satisfaction

	<u>Husbands' Sexual Satisfaction</u>			<u>Wives' Sexual Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
<u>Marital Satisfaction X Empathy</u>						
Intercept ⁺	5.21	0.12	42.74***	5.20	0.13	40.66***
Time _(T+1) ⁺	-0.27	0.06	-4.30***	-0.35	0.08	-4.63***
Sexual Satisfaction _(T) ⁺	0.13	0.06	2.22*	-0.02	0.07	-0.22
Marital Satisfaction _(T) [^]	0.09	0.08	1.19	-0.03	0.08	-0.39
Empathy _(T) [^]	-0.05	0.06	-0.93	0.10	0.07	1.49
Marital Satisfaction x Empathy _(T) [^]	-0.04	0.04	-0.89	0.10	0.04	2.42*
<u>Marital Satisfaction X Perspective taking</u>						
Intercept ⁺	5.23	0.12	43.61***	5.18	0.13	41.06***
Time _(T+1) ⁺	-0.28	0.06	-4.52***	-0.34	0.07	-4.62***
Sexual Satisfaction _(T) ⁺	0.12	0.06	1.94 [†]	-0.02	0.07	-0.25
Marital Satisfaction _(T) [°]	0.10	0.07	1.56	-0.01	0.08	-0.12
Perspective taking _(T) [°]	-0.03	0.05	0.05	0.01	0.07	0.13
Marital Satisfaction x Perspective taking _(T) [°]	-0.02	0.05	-0.34	0.11	0.05	2.32*

Note. ⁺df = 181; [^]df = 1222; [°]df = 1223.

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

Table 15

Partner-Rated Empathy or Perspective taking as Moderators of the Time-Lagged Association Between Marital Satisfaction and Subsequent Sexual Satisfaction

	<u>Husbands' Sexual Satisfaction</u>			<u>Wives' Sexual Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
<u>Marital Satisfaction X Partner Empathy</u>						
Intercept ⁺	5.22	0.12	42.88***	5.19	0.13	40.62***
Time _(T+1) ⁺	-0.27	0.06	-4.43***	-0.34	0.07	-4.55***
Sexual Satisfaction _(T) ⁺	0.11	0.06	1.91 [†]	-0.02	0.07	-0.31
Marital Satisfaction _(T) [^]	0.17	0.09	2.03*	-0.03	0.11	-0.32
Partner Empathy _(T) [^]	-0.09	0.07	-1.39	0.12	0.08	1.59
Marital Satisfaction x Partner Empathy _(T) [^]	0.03	0.06	0.53	0.11	0.06	1.95 [†]
<u>Marital Satisfaction X Partner Perspective taking</u>						
Intercept ⁺	5.34	0.12	45.00***	5.28	0.12	42.46***
Time _(T+1) ⁺	-0.36	0.07	-5.35***	-0.40	0.08	-5.06***
Sexual Satisfaction _(T) ⁺	-0.44	0.05	-8.66***	-0.41	0.06	-6.49***
Marital Satisfaction _(T) [°]	0.20	0.08	2.39*	0.07	0.11	0.58
Partner Perspective taking _(T) [°]	-0.03	0.06	-0.57	0.09	0.09	1.01
Marital Satisfaction x Partner Perspective taking _(T) [°]	0.03	0.05	0.55	0.11	0.07	1.64

Note. ⁺df = 181; [^]df = 1223; [°]df = 1209.

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

Table 16

Partner-Rated Hostile Social Behaviour as a Moderator of the Time-Lagged Association Between Marital Satisfaction and Subsequent Sexual Satisfaction

	<u>Husbands' Sexual Satisfaction</u>			<u>Wives' Sexual Satisfaction</u>		
	Coefficient	SE	t-ratio	Coefficient	SE	t-ratio
Intercept ⁺	5.25	0.12	43.85***	5.17	0.13	40.32***
Time _(T+1) ⁺	-0.28	0.06	-4.63***	-0.34	0.07	-4.58***
Sexual Satisfaction _(T) ⁺	0.11	0.06	1.99*	0.01	0.07	0.09
Marital Satisfaction _(T) [^]	0.11	0.07	1.61	0.03	0.09	0.32
Hostile Social Behaviour _(T) [^]	0.11	0.05	2.04*	-0.04	0.07	-0.48
Marital Satisfaction x Hostile Social Behaviour _(T) [^]	0.02	0.05	0.42	-0.14	0.05	-2.87**

Note. ⁺df = 181; [^]df = 1219.

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

Figures

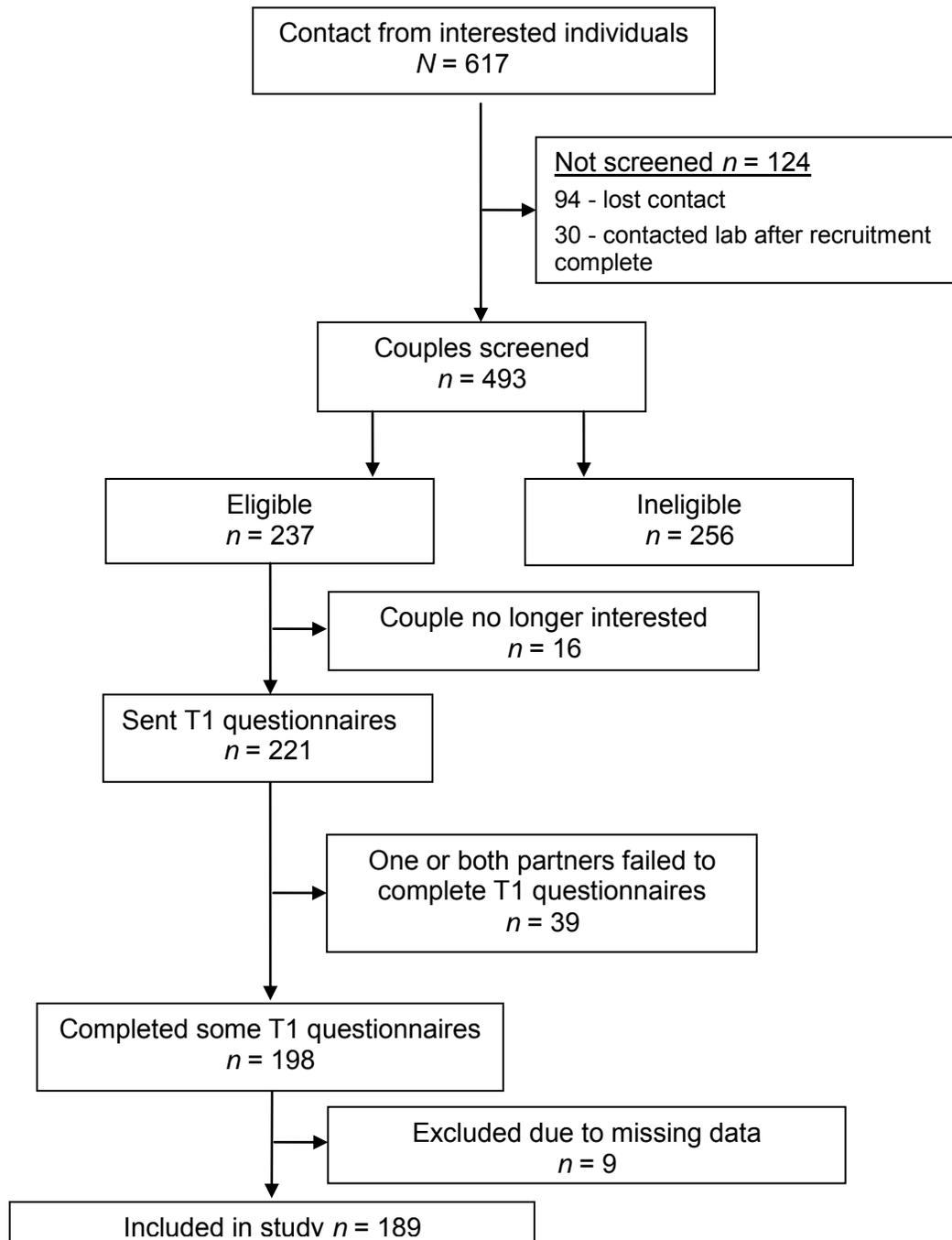


Figure 1. Flowchart of couples included in this study.

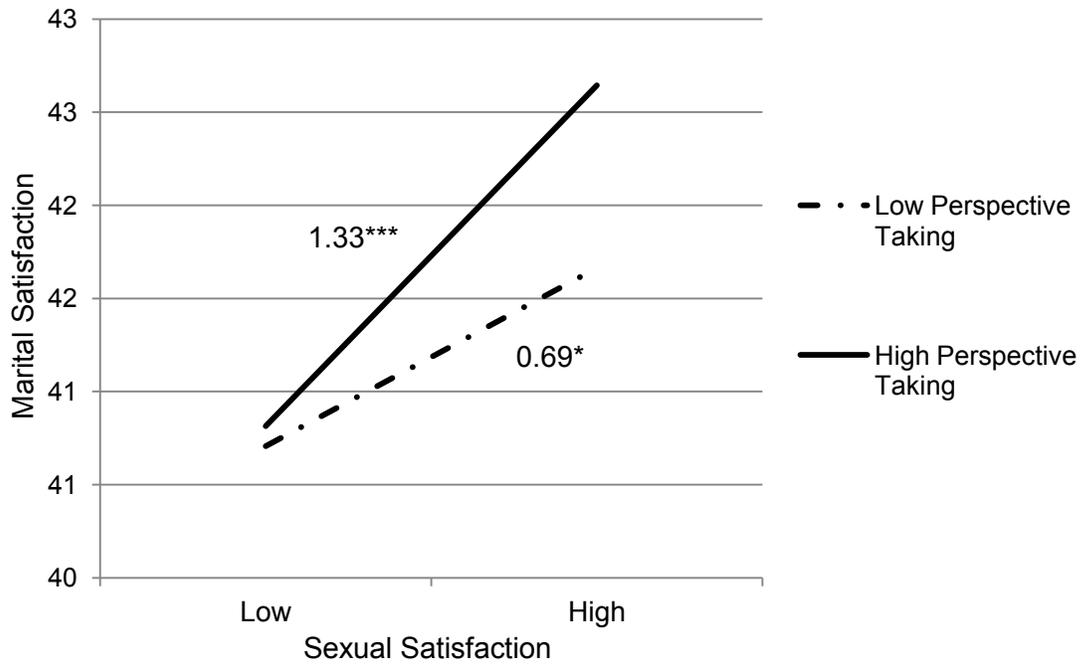


Figure 2. Husbands' perspective taking as a Level 1 moderator of the association between sexual satisfaction and contemporaneous marital satisfaction.

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

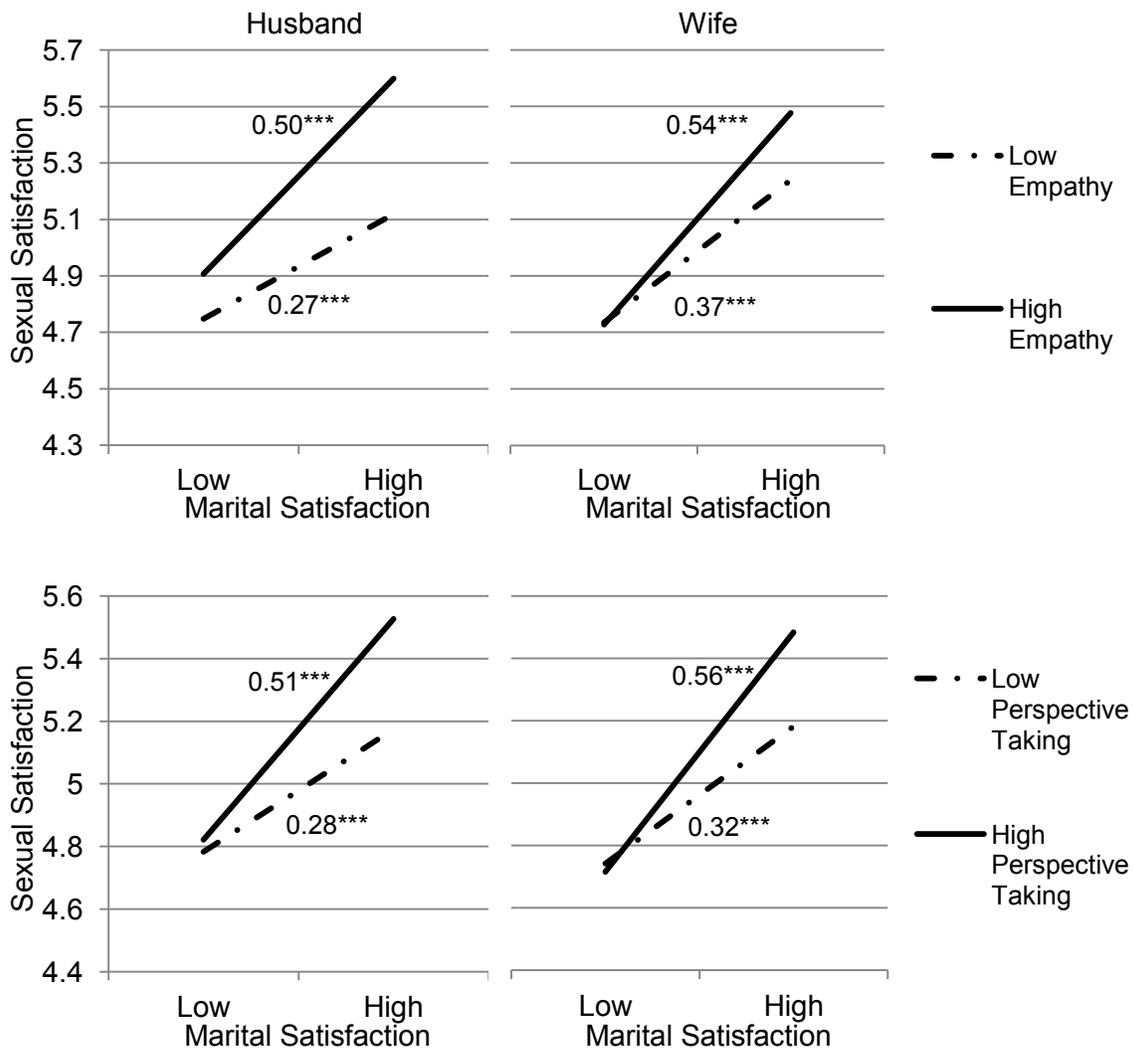


Figure 3. Self-evaluated communication variables as Level 1 moderators of the association between marital satisfaction and contemporaneous sexual satisfaction. * $p < .05$. ** $p < .01$. *** $p < .001$.

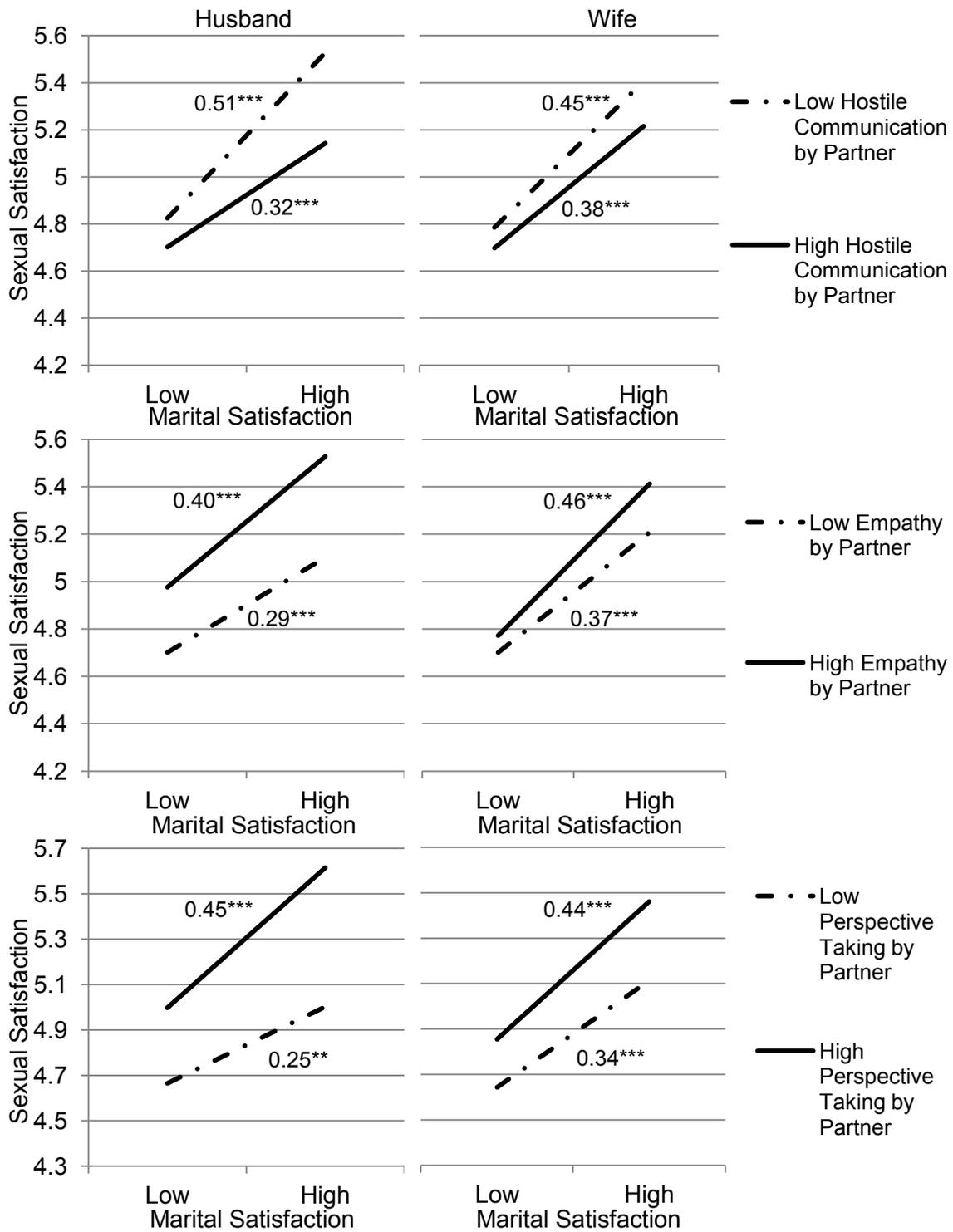


Figure 4. Partner-evaluated communication variables as Level 1 moderators of the association between marital satisfaction and contemporaneous sexual satisfaction.

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

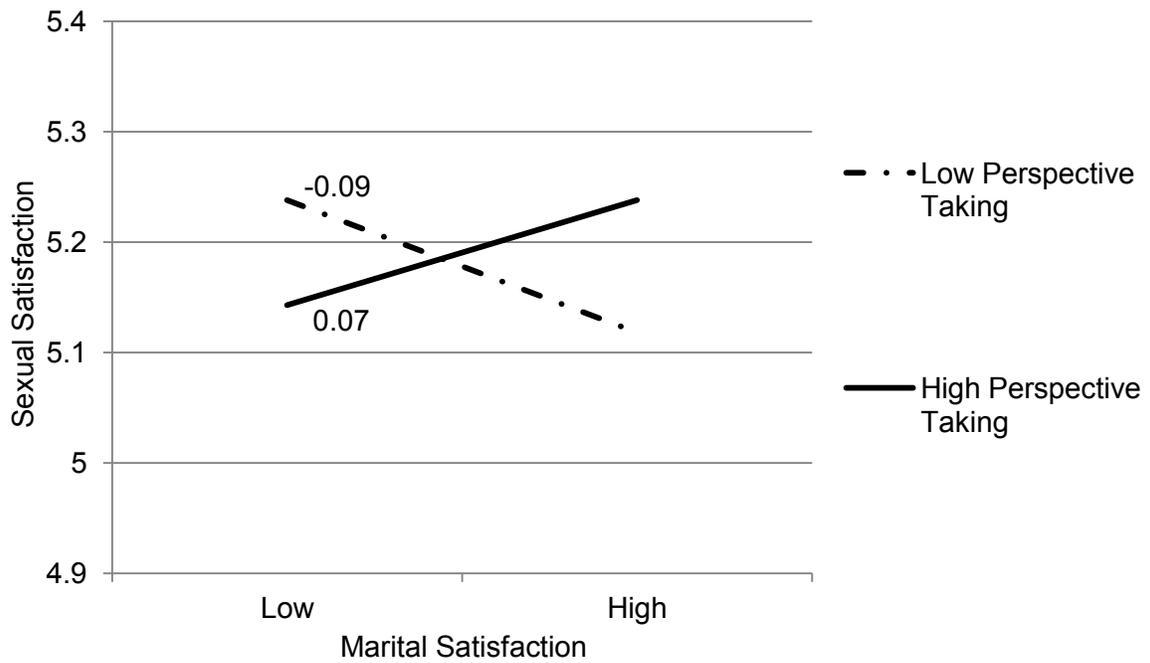
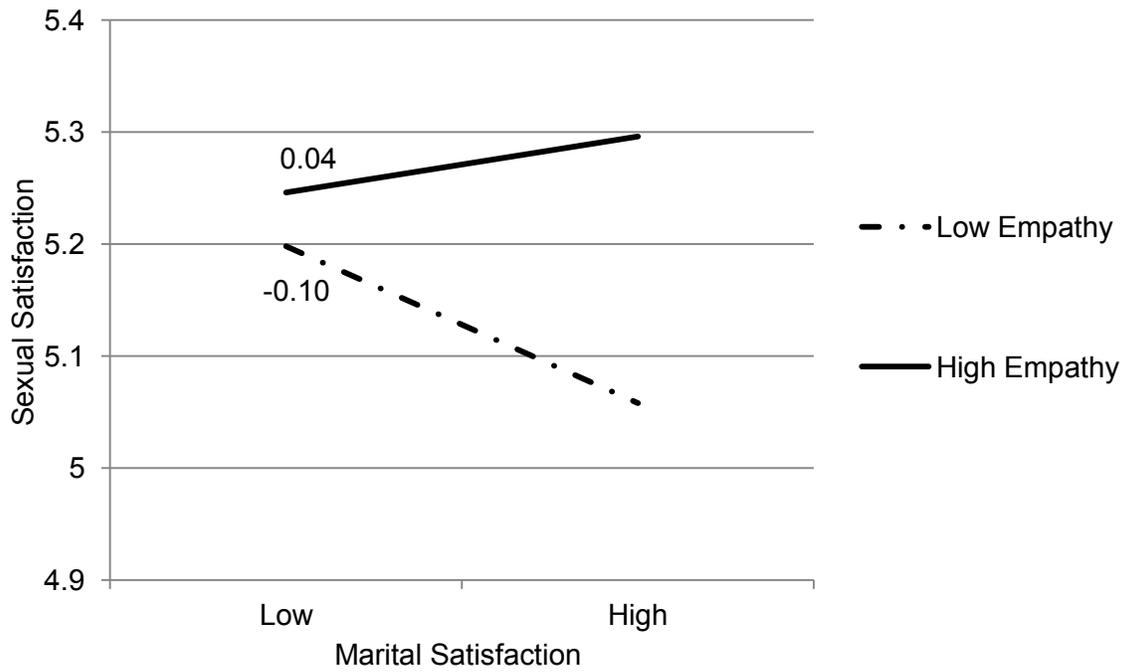


Figure 5. Self-evaluated communication variables as Level 1 moderators of the time-lagged association between wives' marital satisfaction and subsequent sexual satisfaction. * $p < .05$. ** $p < .01$. *** $p < .001$.

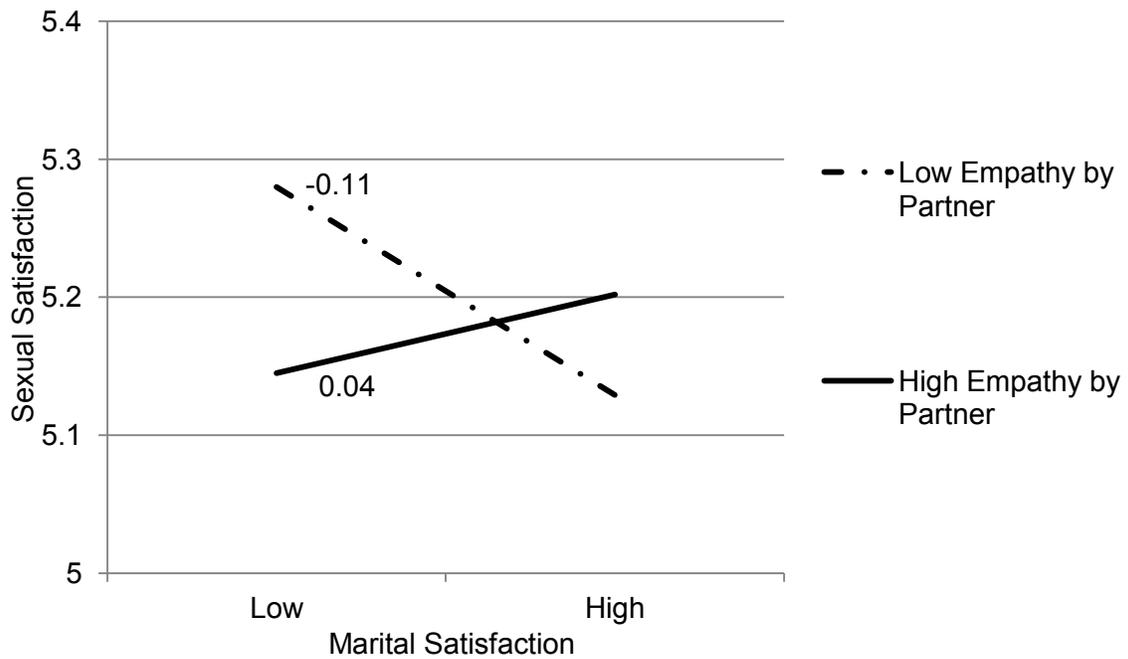
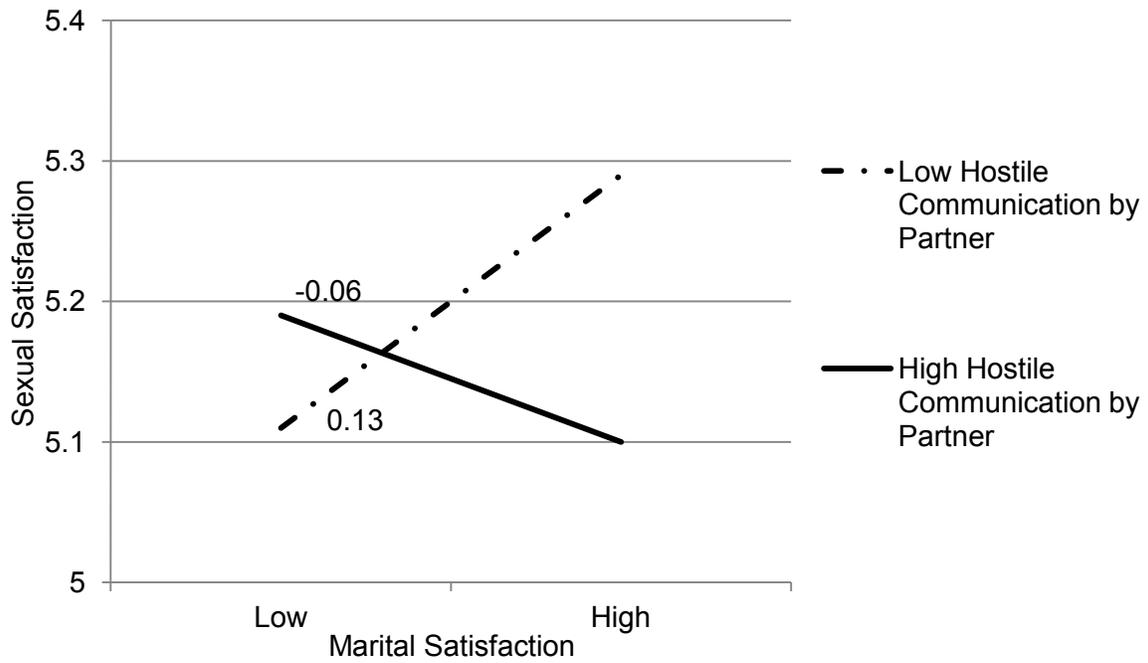


Figure 6. Partner-evaluated communication variables as Level 1 moderators of the time-lagged association between wives' marital satisfaction and subsequent sexual satisfaction. * $p < .05$. ** $p < .01$. *** $p < .001$.