Associations Between Couples' Emotional Expressions and Communication During Sexual Problem Discussions and Relationship and Sexual Satisfaction Over One Year

by

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Abstract

Discussing sexual issues is critical for relationship and sexual satisfaction, but many couples find these discussions to be threatening and avoid them. Therefore, it is important to understand factors that enhance outcomes when couples do take the risk to talk about sexual problems. I examined whether constructive communication behaviours observed during sexual problem discussions mediated associations between emotional expressions (EEs) and relationship and sexual satisfaction over one year in 108 mixed-gender couples. Individuals who expressed more positive emotions (warmth, excitement, humour) communicated more constructively, and individuals who expressed more negative externalizing (frustration, anger, contempt) and negative internalizing (sadness, anxiety) emotions communicated less constructively. With some exceptions, EEs also predicted relationship and sexual satisfaction within and across partners, but individuals' communication was not associated with their relationship satisfaction or their own or partner's sexual satisfaction. However, as predicted, individuals' communication behaviours mediated associations between EEs and partners' relationship satisfaction over one year. Unexpectedly, individuals' communication behaviours did not mediate associations between EEs and their relationship satisfaction or either partner's sexual satisfaction over one year. In sum, constructive communication during sexual problem discussions fosters relationship satisfaction over time, but EEs may be especially potent when it comes to fostering sexual satisfaction. Regardless of how couples communicate about sex, those who create a positive emotional context may be especially likely to experience more satisfying sexual relationships over time.

Keywords: couples; emotions; emotional expressions; sexual communication; relationship satisfaction; sexual satisfaction

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Introduction

Discussing sexual problems is critical for relationship and sexual satisfaction (e.g., Montesi et al., 2010; Rehman et al., 2011a), but many couples find these discussions threatening because they require vulnerability and exposure to negative emotions (Rehman et al., 2019). Therefore, it is important to understand what makes sexual problem discussions effective in fostering increases in relationship and sexual satisfaction over time. One factor may be the ability to regulate emotions, which is a reliable predictor of relationship and sexual satisfaction (e.g., Impett et al., 2012, Pepping et al., 2018) and may be especially important during sensitive discussions about sexual issues. Rosen and Bergeron (2019) have developed the Interpersonal Emotion Regulation Model (IERM), which suggests that the ability to regulate negative emotions associated with sexual problems is central to couples' relationship and sexual functioning. However, there is remarkably little observational research examining how couples navigate sexual problem discussions and the IERM has yet to be directly tested. One barrier to understanding the role of emotion regulation is that it can be difficult to observe, but emotional expressions (EEs) provide a visual representation of emotional states and are an observable component of emotion regulation processes (Gross & Barrett, 2011). Despite the IERM suggesting that emotion regulation directly predicts couple outcomes, emotion regulation may indirectly predict satisfaction by fostering constructive communication, which is more likely to emerge in positive emotional contexts than in negative emotional contexts (e.g., Bloch et al., 2014; Forgas, 2002). Thus, I examined whether constructive communication behaviours mediated associations between EEs and relationship and sexual satisfaction over one year.

Emotion Regulation and Sexual Problem Discussions

Even the most satisfied couples will inevitably have to manage challenges in their sex lives (e.g., desire discrepancies, disagreements about the types of sexual behaviours to engage in), but couples tend to avoid talking about sexual issues (Byers & Demmons, 1999). Individuals report that discussing sexual issues evokes negative emotions about themselves, their partner, and the relationship (Rehman et al., 2019), and they perceive sexual discussions as more important, difficult, and anxiety-provoking than other types of relationship conflict discussions (Rehman et al., 2011a; 2017).

Perhaps this is because sexual discussions require partners to be vulnerable and to expose themselves to rejection, embarrassment, or shame more so than other types of conversations (Metts & Cupach, 1989; Theiss & Estlein, 2014).

Despite these challenges, effective discussions about sex are a strong and consistent predictor of sexual and relationship satisfaction. Women's and men's effective discussions about sex are associated with their own sexual satisfaction (Byers & Demmons, 1999; Jones et al., 2017; Montesi et al., 2010; Rehman et al., 2011b) and in mixed-sex couples, women's effective sexual communication is associated with their male partner's sexual satisfaction (Jones et al., 2017; Rehman et al., 2011b). In particular, the quality of sexual discussions is more strongly related to relationship and sexual satisfaction than the frequency of discussions and sexual self-disclosure (Mallory, 2022). High quality sexual discussions involve openness and warmth, creating feelings of closeness and intimacy between partners. Couples are more relationally satisfied when they have open discussions about sex, over and above openness in non-sexual discussions (Montesi et al., 2010). Thus, sexual problem discussions may be even more influential for relationship satisfaction than discussions about non-sexual problems.

Sexual discussions have a unique influence on relationship and sexual satisfaction, and it is important to understand factors that enhance the quality and outcomes of discussions when couples do take the risk to talk about sexual problems. A factor that may be particularly important in the context of sexual problems is emotion regulation. Emotion regulation is multifaceted and involves becoming aware of emotions (i.e., paying attention to, differentiating, and labelling emotions) and then activating goal-directed processes to modulate the experience (i.e., subjective psychological and physiological experience of emotions and their consequences) and expression (i.e., behaviours that convey emotions) of those emotions (Gross, 2014; Sheppes et al., 2015). Emotion regulation strategies can be evaluated as more or less adaptive depending on whether they reduce or maintain distress in the individual.

The Interpersonal Emotion Regulation Model (IERM) proposed by Rosen and Bergeron (2019) suggests that regulating emotions in the context of sexual problems is an important predictor of couples' psychological, relational, and sexual functioning. The IERM posits that interpersonal factors operating at distal and proximal levels reciprocally influence couples' emotion regulation in response to sexual problems, which in turn

affects couple outcomes such as distress, sexual functioning, sexual satisfaction, and relationship satisfaction. Distal interpersonal factors (e.g., childhood maltreatment, attachment security, or social context) are those that predate the sexual problem and may shape how couples interact and manage challenges. Proximal interpersonal factors (e.g., sexual motivation, responses to sexual pain, and sexual communication) are those that are more temporally and directly linked to the sexual problem and may occur before, during, or after sexual activity. Consistent with the IERM, emotion regulation is a stable predictor of relationship and sexual satisfaction (e.g., Impett et al., 2012, Pepping et al., 2018).

In addition to being an intrapersonal process, emotion regulation can also be conceptualized as an interpersonal process. Most emotion regulation occurs in social contexts, either in response to or in the presence of other people (Gross et al., 2006; Chervonsky & Hunt, 2017). Thus, the ability to regulate emotions has consequences not only for the individual, but also for others who may interact with that individual, such as romantic partners. Research on couples' emotion regulation suggests that if individuals can successfully regulate emotions, they and their partners are more likely to experience relationship satisfaction. For instance, greater use of expressive suppression (i.e., a regulatory strategy that involves inhibiting or concealing emotions) globally and when communicating with a partner is negatively associated with lower relationship satisfaction concurrently for individuals and their partners, and with declines in individuals' relationship satisfaction over time (Impett et al., 2012; Velotti et al., 2016). In contrast, when participants were instructed to use cognitive reappraisal (i.e., a regulatory strategy that involves reinterpreting the meaning of emotional events) when writing about a conflict in their relationship, they were protected against declines in marital quality over one year, in part due to a reduction in distress related to the conflict (Finkel et al., 2013).

Although most research has focused on relationship satisfaction, several studies suggest that the ability to regulate emotions is also associated with sexual satisfaction (see Dubé et al., 2020 and Fischer et al., 2022 for reviews). Emotion regulation is a strong and consistent predictor of sexual satisfaction within person, but dyadic research is limited, and results are somewhat mixed across partners. For example, in women with a history of sexual abuse, greater difficulties with emotion regulation were associated with lower sexual satisfaction independently of age, relationship length, negative affect, anxiety sensitivity, posttraumatic stress symptom severity, and type and severity of

childhood trauma (Rellini et al., 2012; 2010). In research with couples, individual's difficulties with emotion regulation were negatively associated with their own sexual satisfaction but not partners' sexual satisfaction (Ferreira & Cobb, 2018; Pepping et al., 2018). Additionally, among male partners of women with female sexual interest/arousal disorder, men's greater difficulties with emotion regulation were associated with greater sexual distress (Dubé et al., 2019), a construct that is closely related to sexual satisfaction (Stephenson & Meston, 2010).

The Role of Constructive Communication

The IERM proposes emotion regulation as a direct predictor of couple outcomes, however emotion regulation may indirectly predict satisfaction by creating a context for constructive communication (e.g., Bloch et al., 2014). Constructive communication may include problem solving, self-disclosure, validation, offering support, demonstrating interest, and asking clarifying questions and is related to sexual and relationship satisfaction. In contrast, destructive communication may include defensiveness, invalidation, criticism, demanding, stonewalling, and demonstrating a lack of interest and is related to declines in sexual and relationship satisfaction. For example, individuals who report better quality communication report increases in relationship and sexual satisfaction over 18 months (Byers, 2005). Likewise, in observational studies, couples who communicate constructively consistently maintain relationship satisfaction over time whereas couples who communicate destructively experience declines in relationship satisfaction over time and are more likely to end their relationships (e.g., Clements et al., 2004; Kanter et al., 2021).

Although the IERM conceptualizes sexual communication as potentially either a distal or proximal interpersonal risk factor that affects emotion regulation, Rosen and Bergeron (2019) allow for the possibility that constructive communication mediates the association between emotion regulation and outcomes. They suggest that emotion regulation may be particularly important during sexual discussions because it is essential for constructive communication, which is in turn associated with sexual and relationship satisfaction. In other words, constructive behaviours are more likely to emerge when people experience less negative and more positive emotional states. Positive and negative emotional states influence interpersonal behaviours, including how people interpret the behaviours of others, how people make or respond to requests, how people

collaborate with others, and how people problem-solve (for a review, see Forgas, 2002). More salient to this study, the more quickly wives downregulate their negative emotions during conflict discussions, the more constructive their communication behaviours (e.g., problem-solving, compromise, self-disclosure), and in turn, the more likely they and their partner are to maintain relational satisfaction (Bloch et al., 2014). In contrast, self-reported difficulties with emotion regulation account for the tendency for depressed individuals to withdraw when their partner demands (Holley et al., 2018), a communication pattern that is negatively associated with relationship satisfaction (e.g., Schrodt et al., 2014). Similarly, partners' self-reported difficulties regulating emotions predict poor perceived sexual communication and in turn lower daily within and cross partner sexual satisfaction (Ferreira & Cobb, 2018).

Research on specific emotion regulation strategies further highlights that adaptive emotion regulation strategies foster constructive communication, which in turn leads to stable and satisfying romantic and sexual relationships, and that ineffective regulation of emotions derails communication and leads to dissatisfaction. For instance, when individuals are instructed to use expressive suppression when communicating with their partner, they exhibit fewer constructive communication behaviours such as problem solving and validation (Vater & Shroder-Abe, 2015; Peters & Jamieson, 2016). They also have decreased memory for conversation utterances compared to people instructed to use cognitive reappraisal (Richards et al., 2003). Additionally, when individuals self-report greater expressive suppression they perceive more hostile criticism from partners (Klein et al., 2016), which is negatively associated with relationship satisfaction (Campbell et al., 2015). However, when individuals self-report greater use of cognitive reappraisal they perceive more constructive criticism from partners (Klein et al., 2016), which is positively associated with relationship satisfaction (Campbell et al., 2015). In a study of men with hypoactive sexual desire disorder and their partners, men's self-reported use of cognitive reappraisal predicted increased sexual assertiveness (Wang et al., 2023), a factor associated with increased sexual satisfaction. Both partners' self-reported use of expressive suppression was associated with lower sexual assertiveness and men's self-reported use of suppression was also associated with their own and their partners poorer sexual communication. Therefore, it is reasonable to expect that communication behaviour during sexual problem discussions is a mediator of the

associations between emotion regulation and relationship and sexual satisfaction over time.

Directly Observing Emotional Expressions and Communication Behaviours During Sexual Problem Discussions

Despite past research and theory supporting the hypothesis that emotion regulation during sexual problem discussions predicts relationship and sexual satisfaction through communication behaviours, researchers know remarkably little about how couples navigate such discussions in vivo. In most past research on how couples discuss sexual issues researchers have used self-report methods. Self-report measures have the advantage of being easy to administer but their validity is limited by participant response biases, beliefs, and memory (for a review, see Robinson & Clore, 2002). In contrast, observational methods allow for researchers to directly examine important emotional and communication processes in the moment and how partner behaviours affect each other. Observational methods also more closely mirror real-world discussions, improving ecological validity.

The need for observational research on couples' sexual problem discussions is clear, but directly observing emotion regulation presents a challenge. Researchers who have examined emotion regulation during other types of couple discussions have often instructed participants to use specific emotion regulation strategies rather than allowing participants to engage in emotion regulation as they would naturally (or not) (e.g., Richards et al., 2003; Vater & Shroder-Abe, 2015; Peters & Jamieson, 2016). Although these studies have yielded valuable insights about how certain emotion regulation strategies are related to relationship outcomes when people are asked to use them, they do not assess the broad range of emotion regulation strategies that individuals may or may not use. Furthermore, these studies do not assess how individuals spontaneously regulate their emotions during challenging relationship discussions. In response to these critiques some researchers have rated spontaneous expressive suppression during couple conflict discussions (e.g., Thomson et al., 2018). However, the reliability and validity of the ratings were low, possibly because highly effective expressive suppression may not be observable.

One way to address the challenge of observing spontaneous emotion regulation is to instead focus on emotional expressions (EEs). EEs are a visual representation of emotional states and a component of emotion regulation that can be directly observed (Gross & Barrett, 2011). In this study, EEs refer to overt statements and body language including facial expressions (e.g., smiling, frowning), eye movements (e.g., eye rolls), and other physical behaviours (e.g., laughing, crying) that convey emotions such as humour, sadness, or anger. EEs are critical in couple discussions because they can signal individuals' appraisals of a situation and convey acceptance or rejection (e.g., Heerdink et al., 2015). Thus, EEs may be one of the most objective ways for individuals to become aware of what partners are experiencing during a sensitive discussion in which their partner may not explicitly state their feelings.

Bolstering the validity of EEs as an observable component of emotion regulation, how and when individuals express their emotions can reflect strengths and difficulties with emotion regulation (Davies et al., 2016). For example, individuals who were instructed to use expressive suppression strategies during a conflict discussion with their partner were more likely to express negative emotions and individuals who were instructed to use cognitive reappraisal strategies were more likely to express positive emotions, indicating that utilizing constructive emotion regulation strategies may result in more positive and fewer negative emotional expressions (Ben-Naim et al., 2013). Additionally, EEs during couple interactions predict satisfaction in similar ways to emotion regulation strategies. The more negative (e.g., anger) and the fewer positive (e.g., warmth) emotions individuals exhibit during couple interactions, the more likely they are to become relationally distressed and to end their relationships over time (Gottman et al., 1998; 2001; Gottman & Levenson, 1999; Karney & Bradbury, 1995; Lavner & Bradbury, 2010; 2012). Conversely, expressing more positive emotions during couple conflict discussions is generally associated with maintenance or increases in relationship satisfaction and relationship stability over time (Lavner & Bradbury, 2010).

There are only four published observational studies of couples' sexual discussions. One study examined associations between attachment styles and sexual communication behaviours, indicating that attachment avoidance (but not attachment anxiety) predicted more negative and less positive communication for individuals and their partners (McNeil et al., 2018). The other three studies focused on examining differences between couples' sexual and non-sexual discussions. Specifically, couples

tend to behave more positively (e.g., express more warmth, affection, and validation) and less negatively (e.g., express less contempt and frustration) during sexual discussions compared to non-sexual discussions (Rehman et al., 2011a; Rehman et al., 2017; Roels et al., 2022). Couples also exhibit greater similarity in warmth (e.g., meeting a smile with a smile) and lower reciprocity for dominance (e.g., pass control of the conversation back and forth less fluidly) during sexual discussions compared to non-sexual discussions (Rehman et al., 2017). Additionally, couples report higher levels of anxiety prior to engaging in sexual discussions compared to non-sexual discussions (Rehman et al., 2017). Thus, couples tend to behave more cautiously and soften their communication during sexual discussions compared to non-sexual discussions, engaging more positively with each other and being more hesitant to take control of the conversation.

Another important set of findings from observational studies of couples' sexual discussions is that couples' emotions and communication behaviour are associated with relationship outcomes. In a pilot study of 15 couples, observer rated negative communication behaviours (i.e., contemptuous, domineering, belligerent, defensive, and angry behaviors) during sexual conflict discussions predicted relationship dissatisfaction and this association was stronger in the sexual conflict discussions than in non-sexual conflict discussions (Rehman et al., 2011a). In a larger study, women's and men's positive communication behaviours (e.g., affection, validation) during sexual discussions were positively associated with relationship satisfaction and men's, but not women's, negative communication behaviours (e.g., contempt) were negatively associated with relationship satisfaction (Roels et al., 2022). Although these studies provide insight about the importance of sexual communication, in no study was emotion regulation or EEs examined separately from communication behaviours and in all studies only relationship satisfaction (and not sexual satisfaction) was assessed as an outcome.

Current Study and Hypotheses

In an observational study, I examined how sexual communication behaviours mediated associations between EEs and relationship and sexual satisfaction over one year in cohabiting mixed-gender couples. As shown in Figure 1, I predicted that individuals who expressed fewer and less intense negative emotions when discussing a sexual problem with their partner would communicate in a more constructive manner

(Path a), which in turn would lead to increases, or at least maintenance, of both partners' relationship and sexual satisfaction over one year (Paths b_1 and b_2). I also predicted that negative EEs would have direct actor and partner effects on relationship and sexual satisfaction over one year (Paths c_1 and c_2). Finally, I predicted that negative EEs would have indirect actor and partner effects on relationship and sexual satisfaction over one year through constructive communication behaviours (Paths $a*b_1$ and $a*b_2$).

This study addresses several limitations in the extant literature. First, I included couples rather than individuals in relationships to account for the interdependent nature of relationships and examine how partners' EEs and constructive communication behaviours affect each other's outcomes. Second, I examined observed EEs and constructive communication behaviours during couples' sexual problem discussions rather than self-report measures. Using observational methods does not rely on participant awareness of their EEs or communication behaviours and is less prone to influence by participant response biases, beliefs, or memory (for a review, see Robinson & Clore, 2002). Third, by observing EEs, I assessed emotion regulation as it naturally occurred during the discussions rather than instructing participants to use specific types of emotion regulation strategies. Fourth, I extended previous observational research on sexual communication by distinguishing EEs from communication behaviours and assessing relationship and sexual satisfaction outcomes over time rather than just focusing on relationship satisfaction outcomes.

Methods

Participants

Participants were 108 community couples who participated in a one-year study on couples' communication. Eligible couples were in mixed-gender romantic relationships, unmarried, cohabiting for at least one year, between 19 and 45 years old, without children, and not pregnant. These inclusion criteria reduced demographic heterogeneity (see Rogge et al., 2006), but maximized the likelihood that couples would be engaging in regular sexual activity during the study period given that married couples, older couples, those with children, or those who are pregnant tend to engage in less frequent sexual activity than unmarried, younger, childless, non-pregnant couples (e.g., Apt & Hurlbert, 1992; Yabiku & Gager, 2009; Karraker et al., 2011, Radoš et al., 2015). Couples were also fluent in English, had access to a personal computing device and Internet to complete questionnaires, and were able to attend a lab session in-person at Simon Fraser University (SFU).

Demographic characteristics including racial identity, education level, student status, and employment status are in Table 1. At the start of the study, relationships averaged 4.24 years (*SD* = 2.73) and couples had been cohabiting an average of 2.70 years (*SD* = 2.34). Most couples reported that they were monogamous (86.10%), but (by independent self-report) 12 couples agreed that they had in the past been or were currently consensually non-monogamous (e.g., swinging, polyamorous, open relationships) and three couples disagreed about whether they were consensually non-monogamous. In two couples, women reported they were consensually non-monogamous, and their partners did not, whereas in one couple the man reported that they were consensually non-monogamous, and his partner did not. Women averaged 25.32 (*SD* = 4.13) years of age and 15.82 (*SD* = 2.57) years of education, and their average annual income ranged from CAD$10,000-29,999. Men averaged 26.96 (*SD* = 4.54) years of age and 15.24 (*SD* = 2.72) years of education, and their average annual income ranged from CAD$20,000-$29,999.

Procedures

The SFU Research Ethics Board approved all study procedures. Data for this study were collected from 2013 to 2015. Given time, funding, and the planned kinds of analyses, the original goal was to collect a sample of 125 couples. Most couples (44.4%) were recruited through postings on online forums and websites (e.g., Facebook, Reddit, Craigslist), 22.2% were recruited through emails sent to university mailing lists, 13.9% were recruited through posters on bulletin boards on the SFU campus and throughout Metro Vancouver, 11.1% were recruited through newspaper and radio advertisements, and 6.5% were recruited through word of mouth; two couples did not report recruitment source. There were no significant differences among participants on study variables depending on recruitment source.

Individuals contacted the SFU Close Relationships Lab by phone or email and were sent an information email describing the purpose of the study and procedures. One member of the couple was screened by a research assistant (RA) in a 10-minute phone interview to determine eligibility. After providing verbal consent to the phone interview, the caller responded to demographic questions about themselves and their partner (i.e., age, ethnicity, employment status, parental status, fluency in English) and questions about their relationship (i.e., relationship status, length of cohabitation) including the 4-item Couples Satisfaction Index (CSI-4; Funk & Rogge, 2007). Eligible couples who agreed to participate were scheduled for an in-person lab session. See Bowsfield et al. (2019) for a description of the couples screened and included or excluded.

After the phone interview, each member of the couple received a separate email with a consent form and a link to the Time 1 (T1) survey. All surveys took approximately 1 hour to complete online using Remark Web Survey (Gravic, Inc., 2015), which was hosted on a secure SFU server. In the T1 survey, partners provided consent to participate in the study by clicking the appropriate radio button before being directed to complete a series of questionnaires assessing personal, relationship, and sexual factors. Partners were instructed to complete the T1 survey independently and prior to attending the lab session. Approximately one week following the completion of their T1 survey, couples attended the lab session where they participated in several video-recorded discussions, completed a brief questionnaire before and after each discussion, and had physical data measured (i.e., height, weight, body fat percentage). The mean time

between completing their T1 survey and their lab session date was 9.22 days (*SD* = 9.75) for women and 6.23 days (*SD* = 7.72) for men. Couples then received follow-up surveys every four months for one year (Times 2-4) anchored to the T1 survey completion date. The focus of this study is on questionnaires assessing sexual satisfaction at each time point and analyses of the behaviour and emotions in the sexual problem discussion completed in the lab session (see Appendix A for a list of questionnaires administered in the surveys or lab session that are not included in this study). Couples received $50 for completing the T1 survey and lab session, and $25 for completing each of the follow-up surveys (T2-T4), for a total of $125.

Lab Session

At the start of the lab session, an RA provided a brief overview of procedures and consent and asked them to sign the consent form that they had previously viewed prior to completed T1 surveys. Couples then took part in a series of video-recorded discussions (i.e., one discussion about how they met, one sexual problem discussion, and two interpersonal injury discussions). Couples began with the “how we met” discussion to help them become comfortable being recorded and discussing relationship issues in the lab. The order of the sexual problem and interpersonal injury discussions was counterbalanced across lab sessions in advance by using a random number generator.

Sexual problem discussion topics were selected in a multi-step procedure. In the T1 survey, participants responded to a revised version of the Premarital Sexual Conflict Scale (PSCS; Long et al., 1996) where the wording was changed to reflect “tension” rather than “conflict” over sexual problems. Prior to the lab session, an RA identified up to three top rated items that each couple had in common on the PSCS. During the lab session, each partner (male or female first was counterbalanced in advance using a random number generator) was taken separately to an adjacent room to have physical measurements taken and the RA asked if the participant would feel comfortable discussing the pre-selected sexual issues with their partner. Once the participant identified at least one topic that they felt comfortable discussing with their partner, the RA asked for their permission to share the topic(s) with their partner. The procedure was then repeated with the second partner, starting with the pre-approved topics identified by the first partner. After returning to the main lab room, the RA asked the couple to jointly

agree on one preapproved topic to discuss and the RA left the room while they made this decision. If the couple did not identify at least one topic they were willing to discuss, they were asked to jointly choose one sexual issue from an alternate list of potential topics (e.g., How could you spice things up sexually?). If they still could not identify a topic that they were willing to discuss, then they were asked to jointly choose something from a second list of alternate topics that were not specific to their relationship (e.g., What are some common assumptions about sex and couple's sex lives?). Alternate topic lists are in Appendix B. In rare cases, the RA could not identify topics that the couple had in common on the PCSC because one or both partners rated them all as zero (i.e., not a source of tension) or there were no topics in common. In those cases, no topics were presented to individual partners during the physical data measurements and the RA proceeded directly to asking the couple to identify topics from the first alternate list. In a few cases, one partner (or both) did not complete the PSCS questionnaire, and the couple was asked to jointly identify a topic from the PSCS to discuss. If they could not agree on a topic that they were both comfortable discussing, they were presented with the alternate lists of topics as described above. Most couples were able to agree on a topic from the PSCS and only eight couples discussed topics from the alternate lists.

Once couples identified their topic, they were asked to spend the next 10 minutes talking about the topic they chose or closely related matters and were instructed to respond as they normally would. Couples were also told that regardless of who may have raised the issue, they should both be involved in the discussion in some way. Couples were informed that the RA and a camera operator would observe the video from another room and may adjust the cameras but would not listen to their discussions as they occurred. The RA explained that videos would later be viewed and coded by members of the lab team. The RA indicated they would knock on the door when the 10 minutes were complete and then left the room. Partners were seated across from each other and recorded on a split-screen by video cameras wall-mounted above each partner's head. At the end of the lab session, couples were asked to review a form outlining the possible educational and scientific uses for the video recordings and to provide their consent to use the videos for research or other purposes (e.g., presentation at a conference). Couples were also given the option to have their videos deleted.

Attrition

Of the 187 couples who were eligible and agreed to participate, 32 couples decided not to participate in the study prior to being sent T1 questionnaires for various reasons (e.g., too busy, no longer interested, partner uncomfortable with study protocol). Of the 155 couples who received the T1 survey, 21 withdrew before completing the survey, five couples dropped out after only one partner completed survey, and one couple completed the T1 survey but requested that their data be removed. Of the 128 couples who completed the T1 survey, four withdrew before participating in the lab session. Of the 124 couples who participated in the lab session, 15 couples' videos were accidentally deleted when data were transitioned from a hard drive to network storage and one couple requested that their data be removed, resulting in a final sample of 108 couples. Of the 108 couples included in the study, all women and men completed T1 questionnaires and 89.8% of the women and 84.3% of the men completed three or more time points; 100 women and 94 men completed T2, 94 women and 79 men completed T3, and 92 women and 88 men completed T4. There were no differences between participants who completed at least three time points compared to those who did not on any study variable with the exception that men who completed at least three time points had fewer negative internalizing emotions than those who completed fewer than three time points ($t(106) = 1.04$, $p = .01$, $d = .28$). However, when adjusting for multiple comparisons using the Bonferroni correction (i.e., p = .05/12 comparisons) this result was no longer significant.

Measures

Demographics

Demographic questions including age, ethnic identity, English language fluency, sexual orientation, relationship form, relationship length, cohabitation length, employment status, income, years of education, and religious affiliation were assessed in the T1 survey.

Sexual Communication

The Sexual Communication Coding System (SeCCS; Cobb et al., 2017) was developed to assess communication behaviours and EEs during sexual problem discussions in mixed-gender couples. The SeCCS was developed following a review of existing microanalytic coding and global rating systems and the literature on conflict communication and sexual communication. The SeCCS was refined based on discussions among a team including Dr. Rebecca Cobb, three graduate students including myself, and three advanced undergraduate RAs. In an iterative process to develop and refine the SeCCS, the team reviewed, discussed, and microanalytically coded and made global ratings for a subset of approximately 20 sexual discussion videos. Once the SeCCS was finalized, we trained a group of 13 RAs to code and rate the remaining videos. Videos were imported into in NVivo Version 12 (QSR International Pty Ltd., 2018) and each video was independently coded and rated by two RAs (except one, which was only coded by one RA). To code the videos, RAs watched the entire video once without coding anything to establish a context, then they rewatched the video and coded communication behaviours during each participant's speaking turn, pausing and rewatching segments as necessary. Upon completion of the microanalytic coding, RAs completed global ratings of individual and couple communication behaviours and EEs based on information observed throughout the entire video. To ensure reliability and prevent drift, once a month all RAs coded and rated a common subset of videos, which were reviewed in monthly meetings with myself and Dr. Cobb. Strategies to resolve discrepancies included video review, group discussions, and reference to the SeCCS manual.

Although the SeCCS includes microanalytic codes and global ratings, research on observational coding of couples' discussions suggests that many microanalytic codes (e.g., codes per speaking turn) occur too infrequently to be used as standalone codes and instead using broader ratings organized around positive or negative behaviours or emotions is recommended for more reliable assessment of constructs of interest (Heyman et al., 2020). Thus, only global ratings of EEs and communication behaviours were included in analyses for this study. Ratings of EEs and communication behaviours were adapted in part from the Specific Affect Coding System (SPAFF; Gottman et al., 1995), the Marital Interaction Coding System (MICS; Hops et al., 1972), and the Kategoriensystem fuer Partnerschaftliche Interaktion (KPI, Halweg et al., 1984), in

addition to consideration of previous research on sexual problem discussions (e.g., Rehman et al., 2011a). RAs rated EEs for each partner on the following dimensions: warmth/affection, humour, enthusiasm/excitement, frustration, anger, contempt, sadness, and anxiety. EEs were rated on 5-point scale from 0 (*very few expressions of emotion/low intensity of expression*) to 4 (*very high expressions of emotion/high intensity of expression*). RAs also rated the following communication behaviours for each partner: positive engagement, negative engagement, disengagement, openness, dominance, perception of responsibility for the problem, deference to/compliance with partner's needs, whining, and distress. Communication behaviours were rated on a 7-point scale from 1 (*low or absent*) to 7 (*high*). Couple level communication was also rated by RAs, but these ratings are not included in analyses for this study. When making global ratings, RAs were instructed to consider contextual factors (e.g., speech content, tone of voice, facial expressions, and body movements or gestures) during the entire discussion, including during listening turns. An average of the two RA's ratings were computed to yield total scores, except for one video that was only rated by one RA.

The SeCCS ratings were examined prior to analyses to determine whether any categories could be deleted or combined based on conceptual and empirical overlap and for parsimony. After an iterative process of examining the correlations among variables and considering theoretically derived combinations, I created several composite ratings. Regarding EEs, warmth/affection, humour, and enthusiasm/excitement were all positively correlated with each other and negatively correlated with the other EE ratings. Thus, I combined these ratings into a positive EE composite. Furthermore, sadness, anxiety, frustration, anger, and contempt were all positively correlated with each other and negatively correlated with the positive EE ratings. I considered combining them into a single negative EE composite, but expressing "hard" emotions (e.g., anger, frustration, contempt) is generally associated with destructive communication and lower relationship satisfaction, whereas expressing "soft" emotions (e.g., sadness, hurt, fear) is generally associated with constructive communication and increased relationship satisfaction (e.g., Sanford, 2007), suggesting these emotions should not be combined. I examined the pattern of correlations among the remaining EE ratings and sadness and anxiety were more strongly correlated with each other than with the other EE ratings, and frustration, anger, and contempt were more strongly correlated with each other than with other EE ratings. Therefore, I averaged ratings of sadness and anxiety into a negative

internalizing EE composite, and I averaged frustration, anger, and contempt into a negative externalizing EE composite. See Table 2 for correlations among emotional expression ratings.

Regarding communication behaviours, several categories were excluded from this study to reduce conceptual overlap and others were combined into a composite. Specifically, I excluded whining and distress to reduce conceptual overlap with EEs. Additionally, perception of responsibility for the problem and deference to/compliance with partner's needs were also excluded from this study because these categories were only weakly correlated with the other communication behaviours and are less frequently used in other studies, making it harder to compare results across studies. For the sake of parsimony, I created a constructive communication behaviour composite by reverse coding the ratings for negative engagement, disengagement, and dominance and combining those with the ratings for positive engagement and openness. See Table 3 for correlations among communication behaviour ratings. Intraclass correlations for the EE composites and constructive communication behaviours composite ranged from .58 to .76 for women and from .68 to .77 for men, which represent fair (between .40 and .59) to excellent (between .75 and 1.00) agreement (Cicchetti, 1994). Explanations and examples of the SeCCS ratings included in this study are in Appendix C.

Relationship Satisfaction

Participants completed the 16-item Couples Satisfaction Index (CSI-16; Funk & Rogge, 2007) to assess relationship satisfaction. The first item, "Please indicate the degree of happiness, all things considered, of your relationship," is rated on a 7-point scale from 0 (*extremely unhappy*) to 6 (*perfect*). The remaining 15 items are rated on 6-point scales with varying anchor points. To allow for proration of missing data, I conducted a linear transformation such that all items were rated on a 6-point scale. Using the prorated data, relationship satisfaction scores were calculated by summing items, and higher scores indicate greater relationship satisfaction. Scores below 42.92 on the prorated scale suggest relationship dissatisfaction (Funk & Rogge, 2007). 3.7% of women and 7.4% of men scored below the cut-off at T1, 5.6% of women and 3.7% of men scored below the cut-off at T2, 6.5% of women and 3.7% of men scored below the cut-off at T3, and 9.3% of women and 6.5% of men scored below the cut-off at T4.

Internal consistencies (coefficient alpha) met or exceeded .96 at each time point and averaged .97 for women and .96 for men across the four time points (see Table 4).

Sexual Satisfaction

Participants completed the 6-item satisfaction subscale of the Quality of Sex Inventory (QSI-Satisfaction; Shaw & Rogge, 2016) to assess sexual satisfaction in their relationship. Items are rated on a 6-point scale ranging from 0 (*not at all true*) to 5 (*completely true*). Sexual satisfaction scores were calculated by summing items. Higher scores indicate greater sexual satisfaction. Internal consistencies (coefficient alpha) met or exceeded .95 at each time point and averaged .97 for women and .97 for men across the four time points (see Table 4).

Data Analytic Strategy

I conducted multilevel modelling using the MIXED procedure in SPSS Version 29 (as per Kenny et al., 2006) in accordance with the actor-partner interdependence model (APIM; Cook & Kenny, 2005) to examine whether individuals' EEs during the sexual problem discussion predicted communication behaviours and, in turn, whether communication behaviours predicted own and partners' relationship and sexual satisfaction over one year. This data analytic technique allowed me to capitalize on the repeated measurements of satisfaction over time and to account for the dependence of couple data. I tested actor and partner mediation hypotheses simultaneously. The association between individuals' predictors and individuals' outcomes are actor effects and the association between partners' predictors and individuals' outcomes are partner effects.

Repeated measures (i.e., relationship satisfaction and sexual satisfaction) were modelled at Level 1 and time-invariant measures (e.g., EEs and communication behaviours) were modelled at Level 2. Specifically, I regressed relationship and sexual satisfaction (and communication behaviours where applicable) onto EEs. I included time, which was scored as 0 at T1 with each subsequent timepoint as the number of years from T1, as a Level 1 covariate to improve the reliability of estimates. Predictor and mediator variables (e.g., EEs and communication behaviours) were grand mean centred across partners. A variance components covariance structure was used to model

random effects and a heterogenous compound symmetry covariance structure was used to model repeated effects. Indirect effects were estimated using the Hayes (2013) MCMED macro for SPSS to compute the products of the a and b path coefficients (a*b) for the actor and partner models and Monte Carlo 95% confidence intervals for the indirect effects. Confidence intervals that do not include zero indicate that the indirect effect is significant at an alpha level of .05. I first ran each analysis with male and female paths constrained to be equal to yield one set of pooled parameter estimates per test where every male and female is an actor and a partner. I then re-ran all constrained models including gender and its interaction with predictors to examine whether the associations in each model differed by gender. If gender differences were present, I then ran simultaneous models where male and female paths could vary and presented results with unpooled estimates for male and female paths. Models would not converge when modelling random effects separately for women and men, so random effects were pooled across women and men instead. See Appendix D for SPSS syntax for all models.

Missing Data

There were no missing EE and constructive communication ratings at Level 2, as only couples who completed the lab session were included in the study. Missing items on a given questionnaire were prorated (i.e., the individual's mean score for the completed items on a given scale were imputed for any missing items on that scale) when an individual was missing fewer than 20% of items on a questionnaire (Parent, 2013; Shrive et al., 2006; Hawthorne & Elliot, 2005). At higher levels of missingness, proration may be biased and thus the scale score was treated as missing if individuals were missing 20% or more items on a questionnaire (Parent, 2013; Hawthorne & Elliot, 2005). See Table 4 for information about missing data. Except for two individuals at T1 and one individual at T2, all the individuals who were missing a relationship satisfaction scale score were missing all the items on the CSI-16 and 76.5% of those individuals had skipped the survey for that time point. All the individuals who were missing a sexual satisfaction scale score were missing all the items on the QSI-Satisfaction and 76.5% of those individuals had skipped the survey at that time point. Although some individuals were missing data, this is not problematic because the MIXED procedure in SPSS uses a restricted maximum likelihood approach to handle missing data at Level 1 and therefore the same number of observations across participants is not required.

Results

Descriptive Statistics

Means, standard deviations, and internal consistencies for all study variables at each time point and differences between women and men on these variables are in Table 4. Women expressed more negative internalizing and negative externalizing emotions than men, and women reported higher T1 relationship satisfaction than men. However, when adjusting for multiple comparisons using the Bonferroni correction (p = .05/12 comparisons) the only remaining difference was that women expressed more negative internalizing emotions than men. There were no other differences between women and men on study variables. Correlations between study variables for women and men are in Table 5.

Predicting Relationship Satisfaction Over One Year from Emotional Expressions and Constructive Communication Behaviours

In three separate models I examined whether individuals' positive EEs (Figure 2a), negative internalizing EEs (Figure 2b), or negative externalizing EEs (Figure 2c) during the sexual problem discussion predicted constructive communication behaviours and, in turn, whether constructive communication behaviours predicted both partners' relationship satisfaction over one year. The pattern of results was as expected and similar across the three models. There were no significant differences between women and men in any model[1] and thus pooled path estimates are presented in Figures 2a, 2b, and 2c. First, in all models, EEs were associated with constructive communication behaviours as predicted; the more positive and the fewer negative (internalizing and externalizing) emotions individuals expressed, the more constructive their communication (Path a in Figure 1). Second, although there were no actor effects (Path b_1 in Figure 1), there were partner effects of constructive communication behaviours on relationship satisfaction (Path b_2 in Figure 1). In other words, the more individuals

[1] There was a significant gender difference such that women's (but not men's) relationship satisfaction declined over time. This may be because women reported higher relationship satisfaction than men did at T1. However, because there were no gender differences with the main predictors, pooled path estimates are presented.

communicated constructively, the more satisfied their partners were with the relationship. Third, as expected, there were actor and partner effects of EEs on relationship satisfaction (Paths c_1 and c_2 in Figure 1). Specifically, positive EEs had positive actor and partner effects on relationship satisfaction, negative internalizing EEs had negative partner effects on relationship satisfaction, and negative externalizing EEs had negative actor and partner effects on relationship satisfaction. Finally, there were no indirect effects of individuals' EEs on their own relationship satisfaction over one year through their constructive communication behaviours. However, as predicted, there were indirect effects of individuals' positive EEs (*B* = 1.40, 95% CI [0.27, 2.59]; partial mediation), negative internalizing EEs (*B* = -1.15, 95% CI [-1.96, -0.51]; full mediation), and negative externalizing EEs (*B* = -2.52, 95% CI [-4.08, -1.10]; full mediation) on partner's relationship satisfaction over one year through individuals' constructive communication behaviours.

Predicting Sexual Satisfaction Over One Year from Emotional Expressions and Constructive Communication Behaviours

In three separate models I examined whether individuals' positive EEs (Figure 2a), negative internalizing EEs (Figure 2b), and negative externalizing EEs (Figure 2c) during the sexual problem discussion predicted constructive communication behaviours and, in turn, whether constructive communication behaviours predicted both partners' sexual satisfaction over one year. The pattern of results was similar for the three models. There were no significant differences between women and men in the models with positive EEs and negative internalizing EEs and thus pooled path estimates are presented in Figures 3a and 3b. There were gender differences in the direct paths from negative externalizing EEs to sexual satisfaction and thus results are presented with female and male paths unpooled in Figure 3c. First, as in the models predicting relationship satisfaction, EEs were associated with constructive communication behaviours as predicted; the more positive emotions and the fewer negative (internalizing and externalizing) emotions individuals expressed, the more constructive their communication (Path a in Figure 1). Second, unexpectedly and different from the models predicting relationship satisfaction, there were no actor or partner effects of constructive communication behaviours on sexual satisfaction (Paths b_1 and b_2 in Figure

1). Third, as expected, there were actor and partner effects of EEs on sexual satisfaction (Paths c_1 and c_2 in Figure 1). These results differ from the models predicting relationship satisfaction such that positive EEs had positive partner effects (but not actor effects) on sexual satisfaction, negative internalizing EEs had negative actor effects (rather than partner effects) on sexual satisfaction, and negative externalizing EEs had negative actor effects (but not partner effects) on sexual satisfaction for men only. Finally, there were no indirect actor or partner effects of EEs on sexual satisfaction over one year through constructive communication behaviours and thus the mediation model was not supported when predicting sexual satisfaction.

In summary, all six models predicting relationship satisfaction and sexual satisfaction were similar in that EEs consistently predicted constructive communication behaviours and, in most models, EEs predicted relationship and sexual satisfaction. Constructive communication behaviours did not predict sexual satisfaction and had only partner (not actor) effects on relationship satisfaction. Finally, indirect effects only emerged when predicting relationship satisfaction: Individuals' EEs (positive, negative internalizing, and negative externalizing) had indirect effects on partner's relationship satisfaction over one year through individuals' constructive communication behaviours.

Discussion

Couples must inevitably manage challenges in their sex lives, but they tend to avoid talking about sexual issues because they find these conversations threatening. However, when couples do take the risk, talking about sexual challenges is a strong and unique predictor of relationship and sexual satisfaction. Effectively regulating emotions, including EEs, during intimate discussions about sexual problems may be especially important to foster constructive communication, which may in turn lead to relationship and sexual satisfaction. I tested whether constructive communication mediated the association between EEs and relational and sexual satisfaction over one year and hypotheses were partially supported. Individuals' communication behaviours mediated associations between their EEs and partners' relationship satisfaction over one year and the pattern was consistent across positive EEs, negative internalizing EEs, and negative externalizing EEs. However, unexpectedly, individuals' communication behaviours did not mediate associations between EEs (positive, negative internalizing, or negative externalizing) and their relationship satisfaction or their own or partners' sexual satisfaction over one year.

Associations Between EEs and Communication Behaviours

EEs were associated with communication behaviours as predicted. Specifically, in all models, individuals who expressed more positive emotions (warmth, excitement, humour) communicated more constructively by appropriately self-disclosing, asking clarifying questions, demonstrating interest and openness, and generally engaging positively in the discussion. In contrast, individuals who expressed more negative externalizing (frustration, anger, contempt) and negative internalizing (sadness, anxiety) emotions communicated less constructively (i.e., by engaging in fewer constructive behaviours and more destructive behaviours such as demanding, not allowing the other person to express their own thoughts and feelings, demonstrating disinterest, and generally engaging negatively in the discussion).

Participants who were better able to upregulate positive EEs and downregulate negative EEs may have been less likely to become emotionally overwhelmed and therefore better able to direct their attention towards discussing the problem and

constructively working towards a solution. Indeed, previous couple interaction research suggests that when individuals engage in expressive suppression, a regulatory strategy that is typically seen as less adaptive, they express more negative emotions (Ben-Naim et al., 2013), perceive more hostile criticism from partners (Klein et al., 2016), and have difficulties remembering what was said during the conversation, perhaps because suppression requires significant cognitive resources (Richards et al., 2003). Overall, these results are consistent with research on relationship conflict discussions (e.g., Bloch et al., 2014) and highlight that constructive communication behaviours are more likely to emerge in the context of less negative emotional states (for a review, see Forgas, 2002). Although I could not test the direction of effects, these results lend support to the notion that effectively regulating EEs fosters constructive communication during couple interactions.

Associations Between Communication Behaviours and Relationship and Sexual Satisfaction Over One Year

The way individuals communicated during the sexual problem discussions had only partner (not actor) effects on relationship satisfaction over time. Specifically, the more individuals communicated constructively, the happier their partners were with the relationship over time. It may be that constructive communication during threating and anxiety-provoking discussions signals to partners that there is safety and security in the relationship and that may facilitate open discussions and collaborative problem solving, thus affecting partners' perceptions of satisfaction over time. This result contrasts with a recent machine learning study suggesting that partner-reported variables are unlikely to predict increases in relationship quality over and above actor-reported variables (Joel et al., 2020). However, the lack of partner effects emerged in the context of exclusively self-reported predictors, compared to the observational methods used in this study. Observational methods are optimal for examining dyadic interactions and thus, the differing outcomes might be because in this study, individuals were communicating with each other in the moment, rather than reporting on how they would communicate in general or how they had communicated in the past. Overall, the partner effects support the idea that relationships are interactional in nature, a core tenet of all relationship theories (e.g., Finkel et al., 2017).

Although communication during the sexual problem discussion was associated with relationship satisfaction over time, it was not related to either partners' sexual satisfaction. This was surprising because couples were communicating about their sexual relationships, but perhaps other factors are more relevant to sexual satisfaction than the way couples communicate during sexual discussions. Indeed, several previous studies suggest that the frequency of sex, the quality of sexual interactions, and the absence of sexual dysfunction all predict sexual satisfaction (e.g., Velten & Margraf, 2017; Schoenfeld et al., 2017). Thus, it is possible that the communication behaviours exhibited during the sexual problem discussions do not necessarily result in actionable behaviours that improve sexual problems. For instance, even if a couple discussed increasing their frequency of sex in a constructive way, they may not have gone on to actually have sex more often. Moreover, it may be that couples who are more sexually satisfied are able to communicate more constructively about sex rather than the other way around. To the best of my knowledge the available research on the associations between sexual communication and sexual satisfaction does not test this direction of effects, but it is possible that when partners are satisfied with their sex lives they may enjoy talking about sex and this may in turn result in constructive communication behaviours.

Associations Between EEs and Relationship and Sexual Satisfaction Over One Year

With a few exceptions, positive EEs were positively associated with relationship and sexual satisfaction over time, whereas negative EEs were negatively associated with relationship and sexual satisfaction over time. In general, these results are consistent with research indicating that emotion regulation, including regulating EEs, predicts relationship and sexual satisfaction (e.g., Impett et al., 2012, Pepping et al., 2018). Moreover, despite couples' perception that sexual discussions are more challenging and anxiety-provoking than other types of relationship discussions (Rehman et al., 2011a; 2017), these findings suggest that similar processes may be at work during sexual problem discussions as in other types of discussions.

Nevertheless, there are important nuances in the associations between EEs and relationship and sexual satisfaction over time. Specifically, the more warmth, excitement, and humour individuals expressed, the more satisfied individuals and partners were with

their relationship and the more satisfied partners were with their sex life. The more sadness and anxiety individuals expressed, the less satisfied partners were with their relationship and the less satisfied individuals were with their sex life. The more frustration, anger, and contempt individuals expressed, the less satisfied individuals and their partners were with their relationship, and the more men expressed frustration, anger, and contempt the less satisfied they were with their sex life. Thus, broadly speaking, it appears that when it comes to relationship satisfaction, expressing more positive emotions and fewer negative emotions is important for individuals and partners. However, when it comes to sexual satisfaction expressing fewer negative emotions appears to be important for individuals, while expressing more positive emotions appears to be important for partners.

Communication Behaviours as a Mediator of the Associations Between EEs and Relationship and Sexual Satisfaction Over One Year

As predicted, individuals' communication behaviours mediated associations between EEs and partners' relationship satisfaction over one year, but unexpectedly, individuals' communication behaviours did not mediate associations between EEs and their relationship satisfaction or their or partners' sexual satisfaction over one year. The finding that constructive communication behaviours during sexual problem discussions underlie associations between EEs and partners' relationship satisfaction over time is consistent with research on relationship conflict discussions (e.g., Bloch et al., 2014). Moreover, both of these findings reflect that individuals' communication behaviours do not directly affect their relationship satisfaction or their or partners' sexual satisfaction in this study.

The results of this study suggest that the emotional context of sexual problem discussions seem to matter more for sexual satisfaction than how individuals communicate. Specifically, the more individuals expressed warmth, excitement, and humour, the more partners felt sexually satisfied. Additionally, the more individuals expressed sadness and anxiety, the less happy they were with their sex life, and the more men expressed frustration, anger, and contempt, the less happy they were with their sex life. Sexual discussions are threatening, but when couples create a more positive emotional context, they may feel more comfortable disclosing vulnerable

information, which increases emotional intimacy and thus sexual satisfaction (e.g., Pascoal et al., 2012; Rubin & Campbell, 2012). Indeed, individuals' humour is related to increases in partner's experience of emotional intimacy (Horn et al., 2019), whereas difficulties regulating negative emotions undermines intimacy such that individuals perceive less partner disclosure (Tani et al., 2015).

Lack of Gender Differences

A striking finding in this study was the near consistent lack of gender differences, although this should be interpreted cautiously given the relatively small sample size and the lack of consistent gender differences in previous research. In this study, gender differences only emerged in one model such that when men expressed more negative externalizing emotions, they were less sexually satisfied. Women's expressions of negative externalizing emotions were not associated with sexual satisfaction. This gender difference is in line with self-report research on female sexual interest/arousal disorder where men's, but not women's, difficulties with emotion regulation are associated with men's greater sexual distress (Dubé et al., 2019). However, this contrasts with observational studies that suggest there are important gender differences in how emotion regulation or communication behaviours predict relationship satisfaction. For example, in one study wives' (but not husbands') downregulation of negative emotions and communication behaviour is associated with greater relationship satisfaction for themselves and their husbands (Bloch et al., 2014). In contrast, in another study, when men (but not women) communicated more negatively they were less satisfied with their relationship (Roels et al., 2022).

One reason for the relatively invariant effects of gender in this study may be that couples were asked to discuss a mutually identified sexual problem. Although some couples had conflicting opinions about the problem and the need for change, many couples in this study mutually agreed on the need for change (e.g., both partners desired more sexual activity). In other studies, couples selected discussion topics where partners had conflicting opinions and desired the opposite change (e.g., one partner desires more sexual activity whereas the other partner desires less sexual activity). However, gender differences across this and other studies have been inconsistent and there may be other possible explanations for these results.

Limitations and Future Directions

This study has several limitations to consider. First, results may not generalize to the broader population of couples. Volunteers for sexuality research tend to be more comfortable disclosing personal sexual information (Catania et al., 1986), have higher sexual self-esteem, more sexual experience, and more erotophilic sexual attitudes (Bouchard et al., 2019; Dawson et al., 2019; Wiederman, 1999) than individuals who choose not to volunteer for such studies. Furthermore, the couples in this study were relatively young mixed-gender couples who were not married, not pregnant, and did not have children, and thus may not be representative of couples in the broader community. Broadening the scope to include other types of couples (e.g., same-gender couples, older couples, couples who are pregnant or have children) or relationship configurations (e.g., polyamorous relationships) in future research will be important to determine the generalizability of the results.

Second, the format of the sexual problem discussions in the lab may have constrained couples' natural behaviours and did not fully capture important contextual factors. Assessing whether couples had previously discussed the topic and the nature of previous discussions (e.g., when and where it occurred, relative satisfaction with the conversation, emotions experienced and expressed, communication behaviours used) in future will allow researchers to better understand how repeated discussions about sensitive topics affect EEs and communication behaviours and in turn, how this affects subsequent satisfaction. Additionally, previous research suggests that negative communication behaviours may at times be damaging to relationships but can sometimes promote positive outcomes when they alert partners to the severity of problems or to the need for change (for a review, see Overall and McNulty, 2017). Therefore, collecting data that assesses relevant contextual factors may provide researchers with a more nuanced understanding of how different types of communication behaviours may be associated with outcomes.

Third, the methods of assessing EEs and communication behaviours may have missed valuable information. For instance, EEs and communication behaviours were globally assessed across the whole 10-minute discussion rather than assessing the EEs that directly preceded each communication behaviour. This means that the direction of associations between these variables cannot be established. It may be that

communication behaviours predict EEs in addition to or instead of EEs predicting communication behaviours. There is also likely a degree of shared variance between EEs and communication behaviours due to some theoretical overlap and how these constructs were assessed, which is consistent with the moderate associations between EEs and communication behaviours in this study. Additionally, there is evidence that observed EEs may be significantly different than self-reported emotions and may not always accurately reflect an individual's genuinely felt emotions (e.g., Pollak et al., 2022; Barrett et al., 2019). For example, individuals might intentionally hide their true feelings to prevent a conflict with their partner (Winterheld, 2017). Thus, observed EEs may be only one important piece of the puzzle and future studies could include self-reported and observed emotions to discover whether there are differences between felt and expressed emotions.

Finally, I only examined one element of emotion regulation (i.e., observed EEs), which does not capture the full complexity of emotion regulation such as an individual's context and goals. For instance, I do not necessarily know whether couples were engaging in regulatory strategies during the sexual discussions. It is possible that couples expressed fewer negative emotions not because they effectively downregulated their emotions, but rather because they experienced fewer or less intense negative emotions during the conversation. It may also be possible that an individual's goal was to express frustration about their sex life and therefore expressing negative externalizing emotions may be consistent with effective emotion regulation for that individual. To assess the entire construct of emotion regulation rather than just one element, future researchers could ask individuals not only to self-report their emotions but also to report on the specific regulatory goals and strategies that they used during the conversations.

Clinical Implications and Conclusions

Effective communication behaviours during sexual problem discussions underlie associations between EEs and changes in partners' relationship satisfaction and EEs during sexual problem discussions are particularly important when it comes to fostering sexual satisfaction. Many couple and sex therapies already emphasize communication and emotion regulation strategies; however, there is a dearth of observational research evaluating how couples communicate and express emotions during sexual problem discussions. Compared to self-reports, discussing a sexual challenge in the lab more

closely reflects how these conversations may occur in the therapy room and thus the results of this study have important implications for couples' interventions to improve relationship and sexual satisfaction.

Teaching couples how to effectively regulate and express their emotions during vulnerable discussions about sexual tensions or concerns may be especially important to foster relationship and sexual satisfaction. Employing effective emotion regulation strategies during intimate conversations about sex may allow couples to express more positive and fewer negative emotions which, in turn, may bolster constructive communication and lead to improvements in relationship satisfaction over time. Additionally, employing effective emotion regulation strategies to upregulate positive emotions and downregulate negative emotions during potentially threatening and anxiety-inducing discussions about sexual concerns may result in improvements in sexual satisfaction over time by allowing couples to create a warm and loving context that fosters emotional intimacy. Effective emotion regulation may even allow couples to overcome a lack of constructive communication. Thus, clinicians who pay particular attention to emotion regulation and expression and their influence on communication behaviours may be able to improve couples' treatment outcomes by enhancing relationship and sexual satisfaction over time.

Even though couples tend to avoid having sexual discussions, it is inevitable that even the most satisfied couples must manage challenges in their sex lives. This study was one of only a few studies to observe couples having a sexual problem discussion and among the first to distinguish EEs from communication behaviours and assess relationship and sexual satisfaction outcomes over time rather than just focusing on relationship satisfaction outcomes. The results of this study highlight the importance of observing sexual problem discussions to better understand the factors that contribute to relationship and sexual satisfaction over time and points to ways to improve couples' interventions.

Tables and Figures

Table 1. Demographic Characteristics

	Women		Men	
	n	%	*n*	%
Racial Identity				
White	75	69.4	81	75.0
Asian	19	17.6	9	8.3
South Asian	3	2.8	4	3.7
Latinx	0	0.0	3	2.8
Black	0	0.0	1	0.9
Middle Eastern	2	1.9	2	1.9
Indigenous	2	1.9	2	1.9
Mixed Race	7	6.5	6	5.5
Education Level				
Less than high school	1	0.9	5	4.6
High school diploma or equivalent (i.e., GED)	46	42.6	51	47.2
Associate degree	15	13.9	12	11.1
Bachelor's degree	33	30.6	33	30.6
Master's degree	11	10.2	6	5.6
Doctoral degree	1	0.9	0	0.0
Student Status				
Full-time student	52	48.1	37	34.3
Part-time student	10	9.3	13	12.0
Not a student	45	41.7	58	53.7
Employment Status				
Working full-time	38	35.2	54	50.0
Working part-time	32	29.6	35	32.4
Not working or on leave	37	34.3	19	17.6

Note: One woman and one man did not report education level. One woman did not report student status and one woman did not report employment status

Table 2. Correlations Among Emotional Expression Ratings

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.	W Warmth/ Affection	-														
2.	W Humour	.47**	-													
3.	W Enthusiasm/ Excitement	.49**	.52**	-												
4.	W Frustration	-.48**	-.24**	-.10	-											
5.	W Anger	-.35**	-.11	.04	.64**	-										
6.	W Contempt	-.44**	-.09	-.05	.66**	.67**	-									
7.	W Sadness	-.04	-.19	-.08	.45**	.40**	.11	-								
8.	W Anxiety	-.04	-.11	-.15	.24**	.27**	.15	.51**	-							
9.	M Warmth/ Affection	.63**	.40**	.40**	-.21*	-.09	-.21*	.05	.13	-						
10.	M Humour	.43**	.68**	.44**	-.25**	-.13	-.11	-.25**	-.01	.52*	-					
11.	M Enthusiasm/ Excitement	.35**	.34**	.56**	-.13	-.01	-.15	-.02	.00	.59**	.43**	-				
12.	M Frustration	-.42**	-.32**	-.34**	.52**	.21*	.33*	.28**	.25*	-.48**	-.31**	-.17	-			
13.	M Anger	-.18	-.21*	-.18	.25*	.35**	.27**	.23*	.16	-.30**	-.18	-.16	.60**	-		
14.	M Contempt	-.32**	-.17	-.16	.35**	.44**	.54**	.18	.27**	-.34**	-.11	-.15	.61**	.71**	-	
15.	M Sadness	.10	-.15	-.12	.26**	.22*	.10	.60**	.29**	-.09	-.28**	-.15	.37**	.32**	.16	-
16.	M Anxiety	.20*	.03	-.04	.18	.06	.14	.29**	.23*	-.02	-.07	-.18	.18	.05	.00	.61**

Note: W = Women; M = Men.
*$p < .05$. **$p < .01$.

Table 3. Correlations Among Communication Behaviour Ratings

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1.	W Positive Engagement	-												
2.	W Negative Engagement	-.74**	-											
3.	W Disengagement	-.55**	.32**	-										
4.	W Dominance	-.31**	.47**	.05	-									
5.	W Openness	.39**	-.15	-.51**	-.02	-								
6.	W Perception of Responsibility for the Problem	-.21*	.34	-.02	.32**	.08	-							
7.	W Deference to/Compliance with Partner's Needs	-.12	.11	.10	.06	-.08	-.14	-						
8.	M Positive Engagement	.62**	-.45**	-.27**	-.33**	.32**	-.11	-.19*	-					
9.	M Negative Engagement	-.55**	.63**	.31**	.25**	-.28**	.09	.28**	-.71**	-				
10.	M Disengagement	-.29**	.31**	.28**	.40**	-.22**	.11	.19	-.65**	.33**	-			
11.	M Dominance	-.23*	.11	.24**	.09	-.31**	-.07	.26**	-.34**	.52**	-.04	-		
12.	M Openness	.15	-.10	-.10	-.25**	.59**	-.12	.02	.44**	-.18	-.54**	.07	-	
13.	M Perception of Responsibility for the Problem	-.17	.11	.17	-.08	-.17	-.37**	-.01	-.26**	.37**	-.11	.27**	.07	-
14.	M Deference to/Compliance with Partner's Needs	-.04	.15	.79	.45**	-.03	.22*	.15	-.03	-.09	.18	-.15	-.13	-.18

Note: W = Women; M = Men.
*$p < .05$. **$p < .01$.

Table 4. Means, Stadard Deviations, and Internal Consistencies of Study Variables

	Women				Men				Difference	
	M	*SD*	α	*n*	*M*	*SD*	α	*n*	*t*-test	*d*
Emotional Expressions										
Positive	1.96	0.74	.74	108	1.88	0.78	.76	108	1.32	.13
Negative Internalizing	0.81	0.77	.67	108	0.54	0.65	.75	108	3.76***	.36
Negative Externalizing	0.64	0.70	.82	108	0.51	0.64	.80	108	2.02*	.19
Constructive Communication Behaviours	5.52	0.71	.73	108	5.51	0.80	.74	108	0.23	.02
Relationship Satisfaction										
Time 1	68.01	11.04	.96	107	65.21	12.25	.96	106	2.30*	.22
Time 2	67.61	12.00	.96	96	65.83	12.14	.96	87	1.30	.14
Time 3	65.84	13.60	.98	90	66.41	11.30	.96	77	-0.30	-.04
Time 4	63.93	17.32	.98	86	64.35	13.79	.97	83	0.58	.07
Sexual Satisfaction										
Time 1	20.05	7.00	.95	108	20.40	8.16	.97	107	-0.64	-.06
Time 2	19.91	7.96	.97	96	20.97	7.39	.97	88	-0.88	-.09
Time 3	20.06	7.96	.97	89	20.91	7.57	.97	77	-0.47	-.05
Time 4	19.57	8.11	.97	85	19.82	7.77	.96	82	0.09	.01

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

Table 5. Range of Correlations Among Study Variables Across Time Points

		Women						Men				
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Women												
1.	Positive EEs											
2.	Negative Internalizing EEs	-.15	-									
3.	Negative Externalizing EEs	-.30**	.35**	-								
4.	Constructive Communication Behaviours	.48**	-.39**	-.68**	-							
5.	Relationship Satisfaction	.28**	-.12	-.21*	.21*	-						
6.	Sexual Satisfaction	.05	-.24*	-.13	.09	.46**-.60**	-					
Men												
7.	Positive EEs	.70**	-.03	-.22*	.33**	.34**	.15	-				
8.	Negative Internalizing EEs	.02	.44**	.21*	-.18	-.06	-.16	-.17	-			
9.	Negative Externalizing EEs	-.39**	.31**	.50**	-.47**	-.33**	-.21*	-.36**	.23*	-		
10.	Constructive Communication Behaviours	.36**	-.31**	-.41**	.64**	.37**	.16	.58**	-.36**	-.62**	-	
11.	Relationship Satisfaction	.43**	-.20*	-.21*	.30**	.48**-.58**	.28**-.41**	.39**	-.07	-.32**	.25**	-
12.	Sexual Satisfaction	.23*	-.21*	-.13	.15	.25*-.36**	.48* -.63**	.23*	-.12	-.30**	.15	.58**-.65**

Note. EEs = Emotional Expressions. Associations between behaviour or emotions and sexual or relationship satisfaction are expressed as ranges as sexual and relationship satisfaction were assessed four times.
*$p < .05$. **$p < .01$.

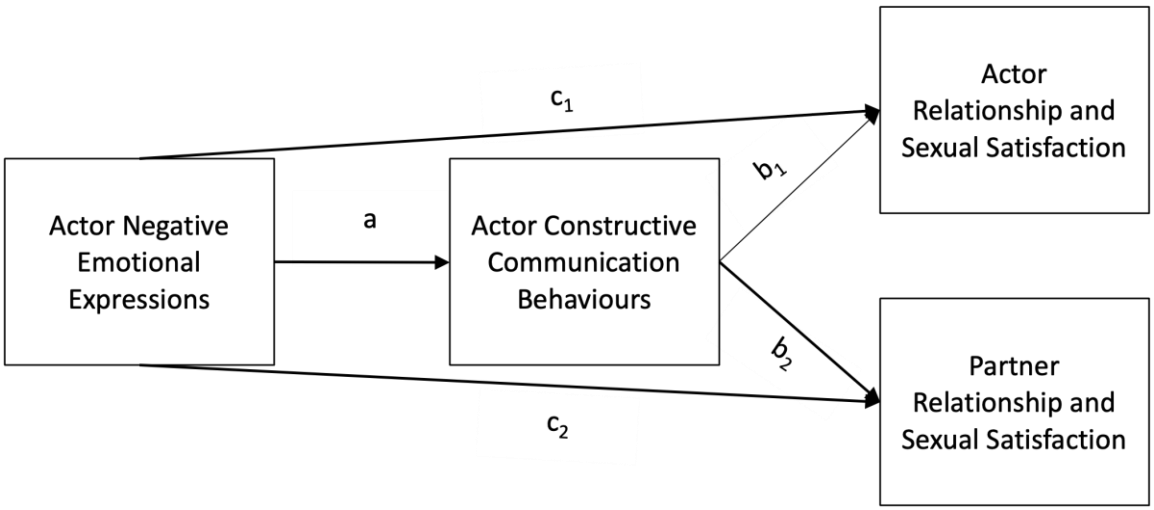

Figure 1. **Hypothesized indirect effects of negative emotional expressions on relationship and sexual satisfaction over one year through constructive communication behaviours**

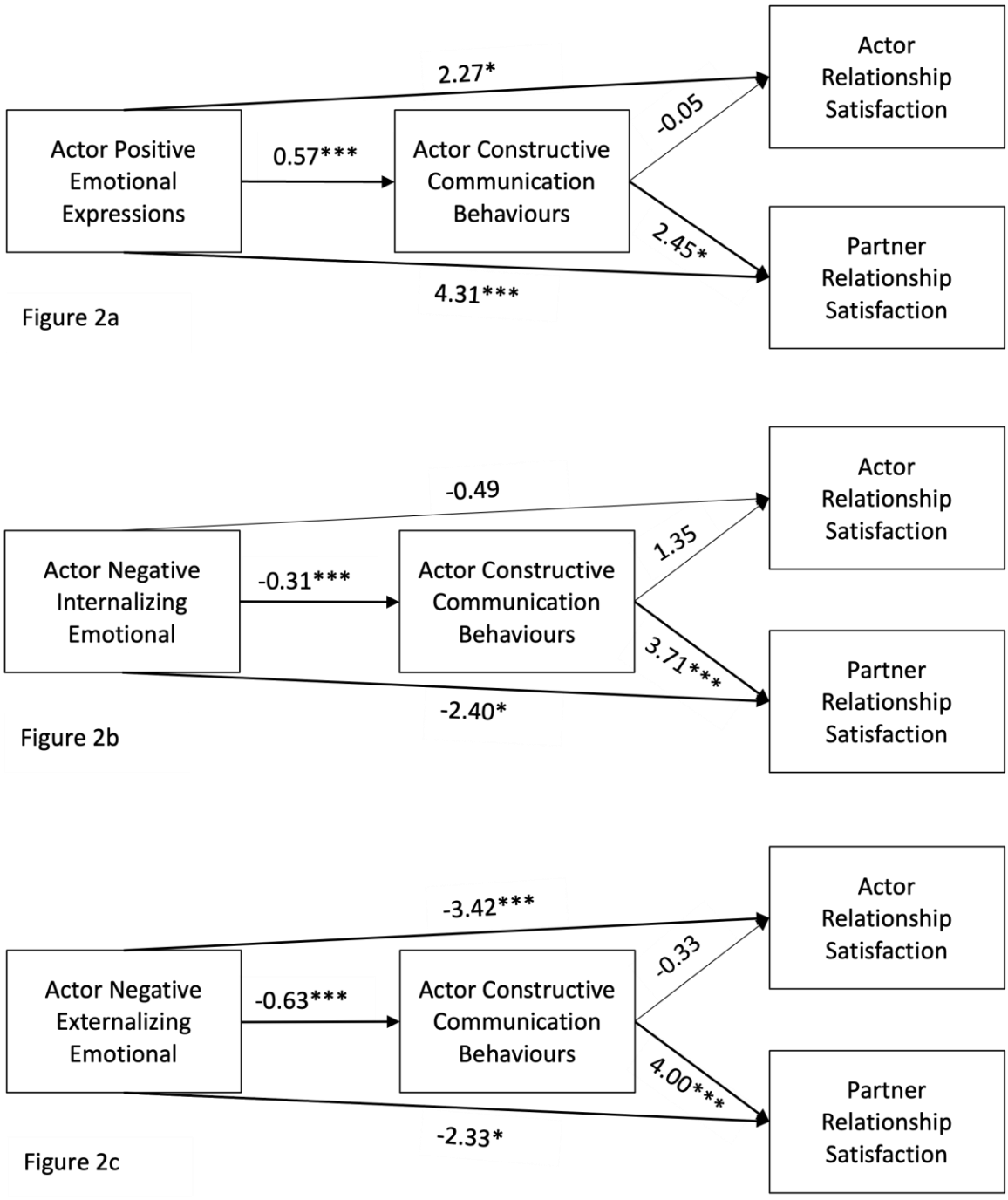

Figure 2. Indirect effects of emotional expressions on relationship satisfaction over one year through constructive communication behaviours

Note: *p < .05. **p < .01. ***p < .001.

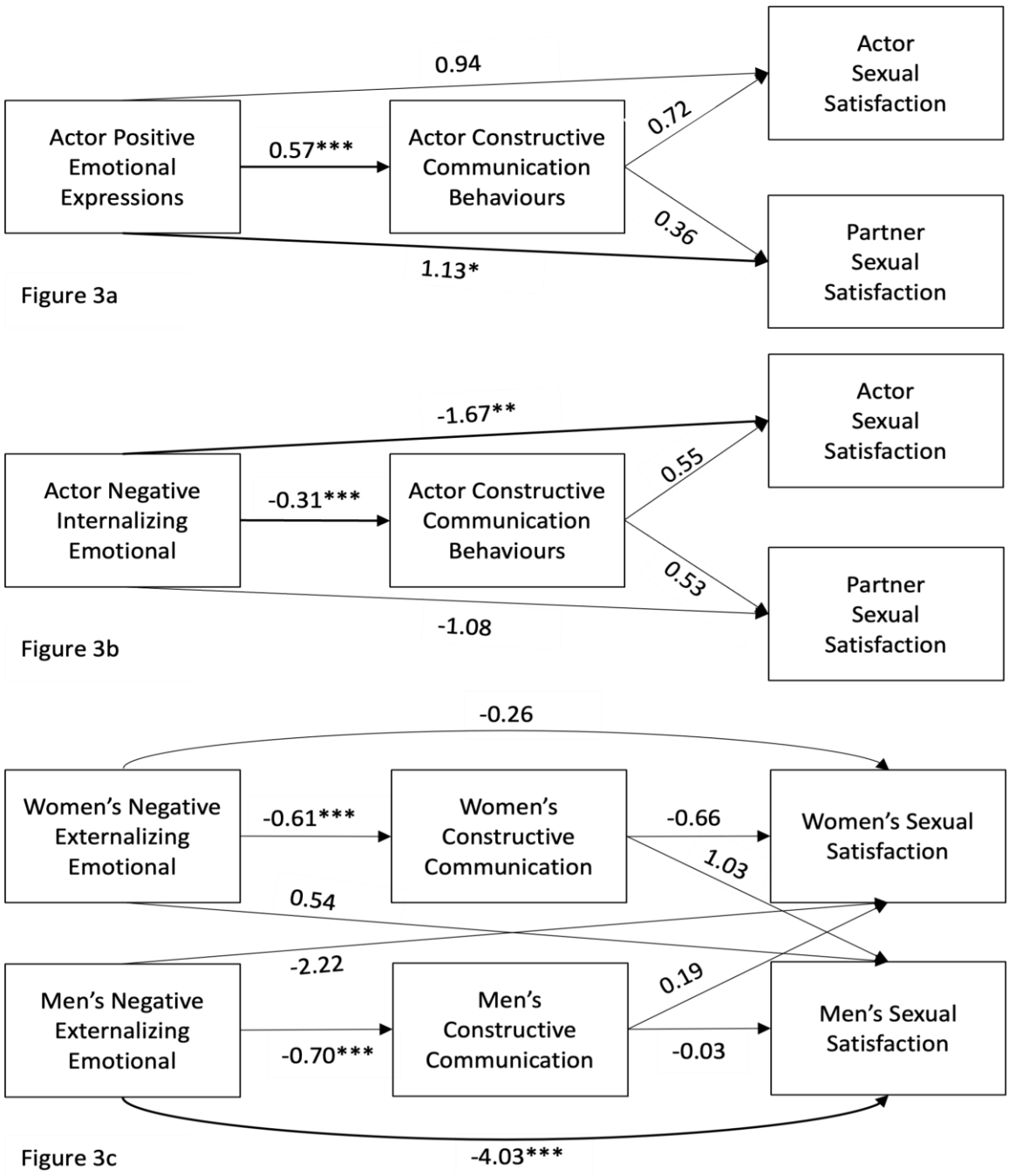

Figure 3. Indirect effects of emotional expressions on sexual satisfaction over one year through constructive communication behaviours

Note: In Figure 3c, all corresponding paths are equal for women and men except the actor effects of EEs on sexual satisfaction. *p < .05. **p < .01. ***p < .001.

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Appendix A.

List of Questionnaires Administered in T1-T4 Surveys or Lab Session

Measure	Time Point(s)
Approach and Avoidance Relationship Goals (Gable, 2006)	T1-T4
Approach and Avoidance Sexual Goals (adapted from Impett et al., 2005 and DeHaas, 2010)	T1-T4
Beck Depression Inventory – II (Beck et al., 1996)	T1-T4
Behavioural Inhibition Scale/Behavioural Activation Scale (Carver & White, 1994)	T1
Body Image Questionnaire (Bowsfield et al., 2015)	T1-T4
Commitment Subscale (Stanley et al., 2010)	T1-T4
Couples Satisfaction Index (Funk & Rogge, 2007)	T1-T4
Demographics (developed for this study)	T1
Dyadic Sexual Communication Scale (Catania, 1986)	T1-T4
Experiences in Close Relationships – Revised (Fraley et al., 2000)	T1-T4
Extra-Dyadic Involvement (Cobb, 2006)	T1-T4
Eysenck Neuroticism Scale (Barrett Petrides et al., 1998)	T1
Fear of Intimacy Scale (Descutner & Thelen, 1991)	T1-T4
Female Sexual Function Index (Rosen et al., 2000)	T1-T4
Heartland Forgiveness Scale (Thompson et al., 2005)	T1-T4
Inclusion of Other in the Self Scale (Aron et al., 1992)	T1-T4
International Index of Erectile Function Questionnaire (Rosen et al., 1997)	T1-T4
Managing Affect and Differences Scale (Arellano & Markman, 1995)	T1-T4
Masturbation	T1-T4
Multidimensional Health Questionnaire (Snell & Johnson, 1997)	T1-T4
Partner-Specific Disclosure Scale (adapted from Finkenauer et al., 2004)	T1-T4

Perceived Responses to Capitalization Attempts – Revised (Gable et al., 2004)	T1-T4
Perceived Responses to Support Seeking (Logan & Cobb, 2012)	T1-T4
Positive and Negative Affect Scales (PANAS; Watson et al., 1998)	Lab Session
Post-Discussion Questionnaire (developed for this study)	Lab Session
Pre-Discussion Questionnaire (developed for this study)	Lab Session
Premarital Sexual Conflict Scale (Long et al., 1996)	T1-T4
Primary Communication Inventory (Navran, 1967)	T1-T4
Quality of Sex Inventory – 24 Item Version (Shaw & Rogge, 2013)	T1-T4
Religiosity (Sullivan, 2001)	T1
Response to Sexual Difficulties (Fallis et al., 2012)	T1-T4
Rosenberg Self-Esteem Scale (Rosenberg, 1965)	T1
Satisfaction with Life Scale (Diener et al., 1985)	T1-T4
Self and Other Dyadic Perspective Taking Scale (Long, 1990)	T1-T4
Sexual Anxiety Scale (Davis et al., 2006)	T1-T4
Sexual Communication Frequency (developed for this study)	T2-T4
Sexual Communication Style Scale (Wrench et al., 2005)	T1-T4
Sexual Frequency (developed for this study)	T2-T4
Social Interaction Anxiety Scale (Mattick & Clarke)	T1-T4
Sexual Opinion Survey (Fisher et al., 1988)	T2-T4

Appendix B.

Alternate Sexual Discussion Topics

First alternate list

1. Is there anything you would like to change or improve with regard to your sexual relationship?
2. How has your sexual relationship changed over time? How would you like it to change in the future?
3. How do you communicate to each other during sexual activity. Are there changes you would like to make in this area?
4. What do you do after you engage in sexual activity? Has this changed over time? What might you do instead?
5. How could you spice things up sexually?
6. What are you hoping your sex life will be like in the future?
7. How could you make sexual activity more enjoyable for both of you?
8. How could you increase intimacy during sex?
9. How do you and your partner communicate about when you wish to engage in sexual activity? Discuss any changes you might want to make in this area.
10. How do you and your partner communicate about when you wish to engage in specific sexual activities? Discuss any changes you might want to make in this area.
11. How will you maintain a good sexual relationship if specific sexual problems arise in the future?
12. How do you each take into account your partner's desires and opinions when it comes to sexual activity?
13. How are you going to keep your sex life fun and satisfying in the long term?
14. What do you enjoy most about your sexual relationship?
15. How do you and your partner incorporate the five senses when engaging in sexual activity? How might you better involve your senses (e.g., smell, taste, touch, sound, sight)?
16. Which situations or circumstances get you most interested in having sex?
17. How do you think your sex life compares to the average couple's sex life?
18. Sexual fantasies – how might you better incorporate each other's sexual fantasies into your sex life?
19. Have you and your partner considered including pornography or sex toys into your sexual relationship? What might be some advantages and/or disadvantages of doing so?
20. What do you think about non-traditional sexual experiences (e.g., threesomes, swinging)? Would you consider engaging in one of these sexual experiences together?

Second Alternate List

- What are some common assumptions about sex and couple's sex lives?
- What are common misconceptions about sex and what are the cultural social influences that create these misconceptions?
- What is the most recent movie sex scene you've watched together? How did the characters behave in the situation? Was their behaviour realistic or not, and how?

Appendix C.

Sexual Communication Coding System (SeCCS) Global Ratings

<table>
<tr><td colspan="7">POSITIVE ENGAGEMENT
Consider the couple's entire interaction and determine what best describes the individual's level of positive engagement. Positive engagement is generally displayed by active and enthusiastic involvement in the discussion through non-verbal behaviour (e.g., attentive head nods or hand gestures, smiling, affective expressions of excitement, joy, empathic sadness) or using back-channels (e.g., "Mmhmm", "Ok", "Yes"). Individuals respond to their partner's' conversation with thoughtful responses that demonstrate that they are engaged in the conversation. This is demonstrated by an interactive discussion as opposed to a one-sided monologue. Positive engagement communicates genuine concern about the partner's thoughts and feelings and is often clear from the questions the partner asks. Positive engagement also includes refocusing the discussion after it is off-task.</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>Low or Absent:
Most of the interaction was either characterized by negative engagement or disengagement</td><td></td><td></td><td>Moderately engaged</td><td></td><td></td><td>High:
The discussion was characterized almost exclusively by positive engagement</td></tr>
<tr><td colspan="7">NEGATIVE ENGAGEMENT
Consider the couples' entire interaction and determine what best describes the individual's level of negative engagement. Generally, this represents involvement in the discussion but in an unproductive or unpleasant way. Negative engagement would include all the negative behaviour codes (e.g., invalidation, criticism, hostility, stonewalling, defensiveness, providing negative solutions, demanding, making distress maintaining attributions, negative reassurance seeking, contempt) and any non-verbal behaviours displayed when they are not speaking (e.g., eye rolling).</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
</table>

Low or Absent: The partner is either positively engaged or disengaged; no negative behaviour or affect directed toward partner			Moderate			**High:** Frequent anger, contempt, hostile affect; non-verbal contempt (e.g., eye rolling, sneers, head shaking); verbal attacks on partner
DISENGAGEMENT Closed–off body language (e.g., folded arms, moving body away from partner), especially when there is a change from a more open position during a turning point in a discussion. Failure to respond to the partner's question. Muscular tenseness and/or rigidity. A sudden decrease in listener backchannel behaviours.						
1	2	3	4	5	6	7
No withdrawal			Moderate withdrawal			Extreme withdrawal
DOMINANCE At the highest levels, the person might be directive or controlling the conversation, demanding, telling the partner what to do, dominating the conversation by talking over the partner or not leaving the other person much room to express their own thoughts and feelings. It is not necessary that one partner be dominant and one submissive in the conversation, both partners may exert their dominance over the other at different points in the conversation, or they may struggle for control. There may also be discussions where neither partner seeks to dominate the other or the conversation. When coding dominance, consider whether one partner speaks much more than the other, interrupts the other person, verbally shuts the partner down, makes demands of the other person.						
1	2	3	4	5	6	7
Not at all dominant/ demanding			Moderately dominant/ demanding			Extremely dominant/ demanding
OPENNESS The openness with which the person discusses sexual issues and their problem specifically. Lower scores on the scale would reflect the use of vague terms and euphemisms, talking around the issue, and not disclosing much personal information.						

This may not necessarily reflect their openness generally but is specific to how they discussed this problem in the video.

1	2	3	4	5	6	7
Extremely closed			Moderately open			Extremely open

EMOTIONAL EXPRESSIONS

Rate each partner on the degree to which they expressed each of the following emotions during the entire discussion, including their listening turns. Consider frequency and intensity of emotions.

- *Warmth/Affection*: reflects genuine care, support, warmth, and tenderness. This would encompass overt statements and non-verbal behaviours. Could include smiling, warm laughter (not humour), flirting, love taps, holding hands, hugging, kissing, or passing tissues without being asked.
- *Humor*: reflects genuine amusement in a positive and agreeable situation, with no ill intention shared by the couple. Could be indicated by a humorous smile, genuine laughter, goofiness (e.g., making one's belly talk to the partner), or uncontrollable laughter.
- *Enthusiasm/Excitement:* reflects a genuine intense interest or excitement; it is different from positive engagement because people can be cognitively positively engaged by listening, responding appropriately, and saying things that are constructive without showing any particular enthusiasm for the subject or the other person.
- *Frustration*: reflects being flustered, upset, losing patience; this is one step down from anger. Could be indicated by sighing, tense body posture, holding head at angle (e.g., looking skeptical), clenching teeth, stuttering, being unable to talk, or redness in the face.
- *Anger:* reflects an intense hostile emotion directed at the partner; more than just being frustrated.
- *Contempt:* reflects disgust, often indicated by eye rolling, a flat hand gesture ("talk to the hand"), sneers, tsking (huffs), or head shaking.
- *Sadness*: reflects genuine emotional pain, sadness, or hurt. Could be indicated by hurt look, passively looking down, shaky voice, watery eyes, or crying.
- *Anxiety*: reflects nervousness, tenseness, and discomfort. Could be indicated by anxious voice tone, shifting in seat, nervous giggle or laughter, fidgeting, stuttering, sweating, looking around, or covering mouth with hand.

0	1	2	3	4
Very few expressions of emotion/low intensity of expression		Moderate expressions of emotion/average intensity of expression		Very high expressions of emotion/high intensity of expression

Appendix D.

SPSS Syntax for All Models

Syntax Key

Obs: A variable that differentiates between partners (men = 1 and women = 2)

TimePoint: T1-T4

CSItot = Couples Satisfaction Index total score

QSIpositive = Quality of Sex Inventory satisfaction subscale

PosEm = Positive EE composite

NegInEm = Negative Internalizing EE composite

NegExEm = Negative Externalizing EE composite

IndivCommunication = Constructive Communication Behaviours composite

TimeYears = Time in years from T1

Predicting Relationship Satisfaction Over One Year from Positive Emotional Expressions and Constructive Communication Behaviours

1A. Syntax for pooled analysis:

```
*Step 1: Emotion --> CSItot (PATH C)

MIXED CSItot WITH PosEm_c P_PosEm_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_PosEm_c PosEm_c
```

```
  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).


*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH PosEm_c P_PosEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= P_PosEm_c PosEm_c

   /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> CSItot (PATH B)

MIXED CSItot WITH IndivCommunication_c P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_IndivCommunication_c IndivCommunication_c

   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 4: Emotion --> CSItot controlling for Communication (PATH C')

MIXED CSItot WITH PosEm_c P_PosEm_c IndivCommunication_c
P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_PosEm_c P_IndivCommunication_c PosEm_c
IndivCommunication_c

   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

1B. Syntax testing for gender differences:

```
*STEP 1: Emotion --> CSItot (PATH C)

MIXED CSItot WITH Gender PosEm_c P_PosEm_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_PosEm_c PosEm_c TimeYears*Gender
P_PosEm_c*Gender PosEm_c*Gender

   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH Gender PosEm_c P_PosEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender P_PosEm_c PosEm_c P_PosEm_c*Gender PosEm_c*Gender

   /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> CSItot (PATH B)

MIXED CSItot WITH Gender IndivCommunication_c P_IndivCommunication_c
TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_IndivCommunication_c IndivCommunication_c
TimeYears*Gender P_IndivCommunication_c*Gender IndivCommunication_c*Gender

   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 4: Emotion --> CSItot controlling for Communication (PATH C')

MIXED CSItot WITH Gender PosEm_c P_PosEm_c IndivCommunication_c
P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_PosEm_c P_IndivCommunication_c PosEm_c
IndivCommunication_c TimeYears*Gender P_PosEm_c*Gender
P_IndivCommunication_c*Gender PosEm_c*Gender IndivCommunication_c*Gender

  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

   /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).



* Encoding: UTF-8.

/* This macro generates a Monte Carlo confidence interval */.

/* for the indirect effect in statistical mediation analysis */.

/* See Appendix B in http://www.guilford.com/p/hayes3 */.

/* for instructions on its use */.

/* Written by Andrew F Hayes */.

/* www.afhayes.com */.

define mcmed (a=!charend ('/') !default(0)/b=!charend ('/') !default(0)

 /sea=!charend('/') !default(1)/seb=!charend('/') !default(1)

 /samples=!charend ('/') !default(10000)/covab=!charend ('/')
```

```
 !default(0)/conf=!charend ('/') !default(95)).

preserve.

set printback=off.

matrix.

compute r={(!sea)*(!sea),!covab;!covab,(!seb)*(!seb)}.

compute errchk=0.

do if (det(r) <= 0).

compute errchk=2.

end if.

do if (!seb <= 0 or !sea <=0).

compute errchk=1.

end if.

compute cilow=((100-!conf)/200).

compute cihigh=1-cilow.

compute cilow=trunc(!samples*cilow).

compute cihigh=trunc((!samples*cihigh)+.999)+1.

do if (cilow < 1 or cihigh > !samples).

compute errchk=3.

end if.

compute pars={!a;!sea;!b;!seb;!covab;!samples;!conf}.
```

```
print pars/title="*** Input Data ***"/rlabels="a:", "SE(a):", "b:","SE(b):", "COV(ab):",
"Samples:", "Conf:"/format = F8.4.

do if (errchk=0).

compute mns={make(!samples,1,!a),make(!samples, 1, !b)}.

compute x1=sqrt(-2*ln(uniform(!samples,2)))&*cos((2*3.14159265358979)*

 uniform(!samples,2)).

compute x1=(x1*chol(r))+mns.

compute ab=x1(:,1)&*x1(:,2).

compute x1={x1,ab}.

compute abtmp=ab.

compute abtmp(GRADE(ab))=ab.

compute ab=abtmp.

save x1/outfile=*/variables=a b ab.

compute mc={(!a*!b), ab(cilow,1), ab(cihigh,1)}.

print mc/title="**** Monte Carlo Confidence Interval ****"/clabels="ab", "LLCI",
"ULCI"/format = F8.4.

end if.

do if (errchk=1).

print/title="ERROR: Standard errors must be positive".

else if (errchk=2).

print/title="ERROR: Entered covariance is not compatible with the standard errors of a
and b".
```

```
else if (errchk=3).

print/title="ERROR: Number of samples is too small for this level of confidence".

end if.

end matrix.

restore.

!enddefine.


*WITHIN-PERSON*

mcmed a=0.57/b=-0.05/sea=0.06/seb=0.99.


*CROSS-PARTNER*

mcmed a=0.57/b=2.45/sea=0.06/seb=0.99.
```

Predicting Relationship Satisfaction Over One Year from Negative Internalizing Emotional Expressions and Constructive Communication Behaviours

2A. Syntax for pooled analysis:

```
*Step 1: Emotion --> CSItot (PATH C)

MIXED CSItot WITH NegInEm_c P_NegInEm_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_NegInEm_c NegInEm_c
```

```
    /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).


*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH NegInEm_c P_NegInEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= P_NegInEm_c NegInEm_c

    /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> CSItot (PATH B)

MIXED CSItot WITH IndivCommunication_c P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_IndivCommunication_c IndivCommunication_c

    /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

*STEP 4: Emotion --> CSItot controlling for Communication (PATH C')

MIXED CSItot WITH NegInEm_c P_NegInEm_c IndivCommunication_c P_IndivCommunication_c TimeYears

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= TimeYears P_NegInEm_c P_IndivCommunication_c NegInEm_c IndivCommunication_c

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

2B. Syntax testing for gender differences:

*STEP 1: Emotion --> CSItot (PATH C)

MIXED CSItot WITH Gender NegInEm_c P_NegInEm_c TimeYears

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= Gender TimeYears P_NegInEm_c NegInEm_c TimeYears*Gender P_NegInEm_c*Gender NegInEm_c*Gender

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

```
*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH Gender NegInEm_c P_NegInEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender P_NegInEm_c NegInEm_c P_NegInEm_c*Gender
NegInEm_c*Gender

      /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> CSItot (PATH B)

MIXED CSItot WITH Gender IndivCommunication_c P_IndivCommunication_c
TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_IndivCommunication_c IndivCommunication_c
TimeYears*Gender P_IndivCommunication_c*Gender IndivCommunication_c*Gender

      /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 4: Emotion --> CSItot controlling for Communication (PATH C')

MIXED CSItot WITH Gender NegInEm_c P_NegInEm_c IndivCommunication_c
P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_NegInEm_c P_IndivCommunication_c NegInEm_c
IndivCommunication_c TimeYears*Gender P_NegInEm_c*Gender
P_IndivCommunication_c*Gender NegInEm_c*Gender IndivCommunication_c*Gender

      /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).



* Encoding: UTF-8.

/* This macro generates a Monte Carlo confidence interval */.

/* for the indirect effect in statistical mediation analysis */.

/* See Appendix B in http://www.guilford.com/p/hayes3 */.

/* for instructions on its use */.

/* Written by Andrew F Hayes */.

/* www.afhayes.com */.

define mcmed (a=!charend ('/') !default(0)/b=!charend ('/') !default(0)

 /sea=!charend('/') !default(1)/seb=!charend('/') !default(1)

 /samples=!charend ('/') !default(10000)/covab=!charend ('/')
```

```
 !default(0)/conf=!charend ('/') !default(95)).

preserve.

set printback=off.

matrix.

compute r={(!sea)*(!sea),!covab;!covab,(!seb)*(!seb)}.

compute errchk=0.

do if (det(r) <= 0).

compute errchk=2.

end if.

do if (!seb <= 0 or !sea <=0).

compute errchk=1.

end if.

compute cilow=((100-!conf)/200).

compute cihigh=1-cilow.

compute cilow=trunc(!samples*cilow).

compute cihigh=trunc((!samples*cihigh)+.999)+1.

do if (cilow < 1 or cihigh > !samples).

compute errchk=3.

end if.

compute pars={!a;!sea;!b;!seb;!covab;!samples;!conf}.
```

```
print pars/title="*** Input Data ***"/rlabels="a:", "SE(a):", "b:","SE(b):", "COV(ab):",
"Samples:", "Conf:"/format = F8.4.

do if (errchk=0).

compute mns={make(!samples,1,!a),make(!samples, 1, !b)}.

compute x1=sqrt(-2*ln(uniform(!samples,2)))&*cos((2*3.14159265358979)*

 uniform(!samples,2)).

compute x1=(x1*chol(r))+mns.

compute ab=x1(:,1)&*x1(:,2).

compute x1={x1,ab}.

compute abtmp=ab.

compute abtmp(GRADE(ab))=ab.

compute ab=abtmp.

save x1/outfile=*/variables=a b ab.

compute mc={(!a*!b), ab(cilow,1), ab(cihigh,1)}.

print mc/title="**** Monte Carlo Confidence Interval ****"/clabels="ab", "LLCI",
"ULCI"/format = F8.4.

end if.

do if (errchk=1).

print/title="ERROR: Standard errors must be positive".

else if (errchk=2).

print/title="ERROR: Entered covariance is not compatible with the standard errors of a
and b".
```

```
else if (errchk=3).

print/title="ERROR: Number of samples is too small for this level of confidence".

end if.

end matrix.

restore.

!enddefine.


*WITHIN-PERSON*

mcmed a=-0.31/b=1.35/sea=0.06/seb=0.93.


*CROSS-PARTNER*

mcmed a=-0.31/b=3.71/sea=0.06/seb=0.93.
```

Predicting Relationship Satisfaction Over One Year from Negative Externalizing Emotional Expressions and Constructive Communication Behaviours

3A. Syntax for pooled analysis:

```
*Step 1: Emotion --> CSItot (PATH C)

MIXED CSItot WITH NegExEm_c P_NegExEm_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_NegExEm_c NegExEm_c
```

```
   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).


*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH NegExEm_c P_NegExEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= P_NegExEm_c NegExEm_c

   /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> CSItot (PATH B)

MIXED CSItot WITH IndivCommunication_c P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_IndivCommunication_c IndivCommunication_c

   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

*STEP 4: Emotion --> CSItot controlling for Communication (PATH C')

MIXED CSItot WITH NegExEm_c P_NegExEm_c IndivCommunication_c P_IndivCommunication_c TimeYears

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= TimeYears P_NegExEm_c P_IndivCommunication_c NegExEm_c IndivCommunication_c

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

3B. Syntax testing for gender differences:

*STEP 1: Emotion --> CSItot (PATH C)

MIXED CSItot WITH Gender NegExEm_c P_NegExEm_c TimeYears

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= Gender TimeYears P_NegExEm_c NegExEm_c TimeYears*Gender P_NegExEm_c*Gender NegExEm_c*Gender

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

```
*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH Gender NegExEm_c P_NegExEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender P_NegExEm_c NegExEm_c P_NegExEm_c*Gender
NegExEm_c*Gender

    /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> CSItot (PATH B)

MIXED CSItot WITH Gender IndivCommunication_c P_IndivCommunication_c
TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_IndivCommunication_c IndivCommunication_c
TimeYears*Gender P_IndivCommunication_c*Gender IndivCommunication_c*Gender

    /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 4: Emotion --> CSItot controlling for Communication (PATH C')

MIXED CSItot WITH Gender NegExEm_c P_NegExEm_c IndivCommunication_c
P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_NegExEm_c P_IndivCommunication_c NegExEm_c
IndivCommunication_c TimeYears*Gender P_NegExEm_c*Gender
P_IndivCommunication_c*Gender NegExEm_c*Gender IndivCommunication_c*Gender

    /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).



* Encoding: UTF-8.

/* This macro generates a Monte Carlo confidence interval */.

/* for the indirect effect in statistical mediation analysis */.

/* See Appendix B in http://www.guilford.com/p/hayes3 */.

/* for instructions on its use */.

/* Written by Andrew F Hayes */.

/* www.afhayes.com */.

define mcmed (a=!charend ('/') !default(0)/b=!charend ('/') !default(0)

 /sea=!charend('/') !default(1)/seb=!charend('/') !default(1)

 /samples=!charend ('/') !default(10000)/covab=!charend ('/')
```

```
 !default(0)/conf=!charend ('/') !default(95)).

preserve.

set printback=off.

matrix.

compute r={(!sea)*(!sea),!covab;!covab,(!seb)*(!seb)}.

compute errchk=0.

do if (det(r) <= 0).

compute errchk=2.

end if.

do if (!seb <= 0 or !sea <=0).

compute errchk=1.

end if.

compute cilow=((100-!conf)/200).

compute cihigh=1-cilow.

compute cilow=trunc(!samples*cilow).

compute cihigh=trunc((!samples*cihigh)+.999)+1.

do if (cilow < 1 or cihigh > !samples).

compute errchk=3.

end if.

compute pars={!a;!sea;!b;!seb;!covab;!samples;!conf}.
```

```
print pars/title="*** Input Data ***"/rlabels="a:", "SE(a):", "b:","SE(b):", "COV(ab):",
"Samples:", "Conf:"/format = F8.4.

do if (errchk=0).

compute mns={make(!samples,1,!a),make(!samples, 1, !b)}.

compute x1=sqrt(-2*ln(uniform(!samples,2)))&*cos((2*3.14159265358979)*

 uniform(!samples,2)).

compute x1=(x1*chol(r))+mns.

compute ab=x1(:,1)&*x1(:,2).

compute x1={x1,ab}.

compute abtmp=ab.

compute abtmp(GRADE(ab))=ab.

compute ab=abtmp.

save x1/outfile=*/variables=a b ab.

compute mc={(!a*!b), ab(cilow,1), ab(cihigh,1)}.

print mc/title="**** Monte Carlo Confidence Interval ****"/clabels="ab", "LLCI",
"ULCI"/format = F8.4.

end if.

do if (errchk=1).

print/title="ERROR: Standard errors must be positive".

else if (errchk=2).

print/title="ERROR: Entered covariance is not compatible with the standard errors of a
and b".
```

```
else if (errchk=3).

print/title="ERROR: Number of samples is too small for this level of confidence".

end if.

end matrix.

restore.

!enddefine.


*WITHIN-PERSON*

mcmed a=-0.63/b=-0.33/sea=0.06/seb=1.12.


*CROSS-PARTNER*

mcmed a=-0.63/b=4.00/sea=0.06/seb=1.12.
```

Predicting Sexual Satisfaction Over One Year from Positive Emotional Expressions and Constructive Communication Behaviours

4A. Syntax for pooled analysis:

```
MIXED QSIpositive WITH PosEm_c P_PosEm_c TimeYears Man Woman

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_PosEm_c PosEm_c

  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)
```

```
  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).


*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH PosEm_c P_PosEm_c Man Woman

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= P_PosEm_c PosEm_c

  /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> QSIpositive (PATH B)

MIXED QSIpositive WITH IndivCommunication_c P_IndivCommunication_c TimeYears
Man Woman

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_IndivCommunication_c IndivCommunication_c

  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

*STEP 4: Emotion --> QSIpositive controlling for Communication (PATH C')

MIXED QSIpositive WITH PosEm_c P_PosEm_c IndivCommunication_c P_IndivCommunication_c TimeYears Man Woman

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= TimeYears P_PosEm_c P_IndivCommunication_c PosEm_c IndivCommunication_c

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

4B. Syntax testing for gender differences:

*STEP 1: Emotion --> QSIpositive (PATH C)

MIXED QSIpositive WITH Gender PosEm_c P_PosEm_c TimeYears

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= Gender TimeYears P_PosEm_c PosEm_c TimeYears*Gender P_PosEm_c*Gender PosEm_c*Gender

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

```
*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH Gender PosEm_c P_PosEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender P_PosEm_c PosEm_c P_PosEm_c*Gender PosEm_c*Gender

    /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> QSIpositive (PATH B)

MIXED QSIpositive WITH Gender IndivCommunication_c P_IndivCommunication_c
TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_IndivCommunication_c IndivCommunication_c
TimeYears*Gender P_IndivCommunication_c*Gender IndivCommunication_c*Gender

    /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 4: Emotion --> QSIpositive controlling for Communication (PATH C')

MIXED QSIpositive WITH Gender PosEm_c P_PosEm_c IndivCommunication_c
P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_PosEm_c P_IndivCommunication_c PosEm_c
IndivCommunication_c TimeYears*Gender P_PosEm_c*Gender
P_IndivCommunication_c*Gender PosEm_c*Gender IndivCommunication_c*Gender

    /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).



* Encoding: UTF-8.

/* This macro generates a Monte Carlo confidence interval */.

/* for the indirect effect in statistical mediation analysis */.

/* See Appendix B in http://www.guilford.com/p/hayes3 */.

/* for instructions on its use */.

/* Written by Andrew F Hayes */.

/* www.afhayes.com */.

define mcmed (a=!charend ('/') !default(0)/b=!charend ('/') !default(0)

 /sea=!charend('/') !default(1)/seb=!charend('/') !default(1)

 /samples=!charend ('/') !default(10000)/covab=!charend ('/')
```

```
 !default(0)/conf=!charend ('/') !default(95)).

preserve.

set printback=off.

matrix.

compute r={(!sea)*(!sea),!covab;!covab,(!seb)*(!seb)}.

compute errchk=0.

do if (det(r) <= 0).

compute errchk=2.

end if.

do if (!seb <= 0 or !sea <=0).

compute errchk=1.

end if.

compute cilow=((100-!conf)/200).

compute cihigh=1-cilow.

compute cilow=trunc(!samples*cilow).

compute cihigh=trunc((!samples*cihigh)+.999)+1.

do if (cilow < 1 or cihigh > !samples).

compute errchk=3.

end if.

compute pars={!a;!sea;!b;!seb;!covab;!samples;!conf}.
```

```
print pars/title="*** Input Data ***"/rlabels="a:", "SE(a):", "b:","SE(b):", "COV(ab):",
"Samples:", "Conf:"/format = F8.4.

do if (errchk=0).

compute mns={make(!samples,1,!a),make(!samples, 1, !b)}.

compute x1=sqrt(-2*ln(uniform(!samples,2)))&*cos((2*3.14159265358979)*

 uniform(!samples,2)).

compute x1=(x1*chol(r))+mns.

compute ab=x1(:,1)&*x1(:,2).

compute x1={x1,ab}.

compute abtmp=ab.

compute abtmp(GRADE(ab))=ab.

compute ab=abtmp.

save x1/outfile=*/variables=a b ab.

compute mc={(!a*!b), ab(cilow,1), ab(cihigh,1)}.

print mc/title="**** Monte Carlo Confidence Interval ****"/clabels="ab", "LLCI",
"ULCI"/format = F8.4.

end if.

do if (errchk=1).

print/title="ERROR: Standard errors must be positive".

else if (errchk=2).

print/title="ERROR: Entered covariance is not compatible with the standard errors of a
and b".
```

```
else if (errchk=3).

print/title="ERROR: Number of samples is too small for this level of confidence".

end if.

end matrix.

restore.

!enddefine.


*WITHIN-PERSON*

mcmed a=0.57/b=0.72/sea=0.06/seb=0.65.


*CROSS-PARTNER*

mcmed a=0.57/b=0.36/sea=0.06/seb=0.65.
```

Predicting Sexual Satisfaction Over One Year from Negative Internalizing Emotional Expressions and Constructive Communication Behaviours

5A. Syntax for pooled analysis:

```
*Step 1: Emotion --> QSIpositive (PATH C)

MIXED QSIpositive WITH NegInEm_c P_NegInEm_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_NegInEm_c NegInEm_c
```

```
  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).


*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH NegInEm_c P_NegInEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= P_NegInEm_c NegInEm_c

  /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> QSIpositive (PATH B)

MIXED QSIpositive WITH IndivCommunication_c P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_IndivCommunication_c IndivCommunication_c

  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

*STEP 4: Emotion --> QSIpositive controlling for Communication (PATH C')

MIXED QSIpositive WITH NegInEm_c P_NegInEm_c IndivCommunication_c P_IndivCommunication_c TimeYears

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= TimeYears P_NegInEm_c P_IndivCommunication_c NegInEm_c IndivCommunication_c

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

5B. Syntax testing for gender differences:

*STEP 1: Emotion --> QSIpositive (PATH C)

MIXED QSIpositive WITH Gender NegInEm_c P_NegInEm_c TimeYears

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= Gender TimeYears P_NegInEm_c NegInEm_c TimeYears*Gender P_NegInEm_c*Gender NegInEm_c*Gender

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

```
*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH Gender NegInEm_c P_NegInEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender P_NegInEm_c NegInEm_c P_NegInEm_c*Gender
NegInEm_c*Gender

  /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> QSIpositive (PATH B)

MIXED QSIpositive WITH Gender IndivCommunication_c P_IndivCommunication_c
TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_IndivCommunication_c IndivCommunication_c
TimeYears*Gender P_IndivCommunication_c*Gender IndivCommunication_c*Gender

  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 4: Emotion --> QSIpositive controlling for Communication (PATH C')

MIXED QSIpositive WITH Gender NegInEm_c P_NegInEm_c IndivCommunication_c
P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_NegInEm_c P_IndivCommunication_c NegInEm_c
IndivCommunication_c TimeYears*Gender P_NegInEm_c*Gender
P_IndivCommunication_c*Gender NegInEm_c*Gender IndivCommunication_c*Gender

  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).



* Encoding: UTF-8.

/* This macro generates a Monte Carlo confidence interval */.

/* for the indirect effect in statistical mediation analysis */.

/* See Appendix B in http://www.guilford.com/p/hayes3 */.

/* for instructions on its use */.

/* Written by Andrew F Hayes */.

/* www.afhayes.com */.

define mcmed (a=!charend ('/') !default(0)/b=!charend ('/') !default(0)

 /sea=!charend('/') !default(1)/seb=!charend('/') !default(1)

 /samples=!charend ('/') !default(10000)/covab=!charend ('/')
```

```
 !default(0)/conf=!charend ('/') !default(95)).

preserve.

set printback=off.

matrix.

compute r={(!sea)*(!sea),!covab;!covab,(!seb)*(!seb)}.

compute errchk=0.

do if (det(r) <= 0).

compute errchk=2.

end if.

do if (!seb <= 0 or !sea <=0).

compute errchk=1.

end if.

compute cilow=((100-!conf)/200).

compute cihigh=1-cilow.

compute cilow=trunc(!samples*cilow).

compute cihigh=trunc((!samples*cihigh)+.999)+1.

do if (cilow < 1 or cihigh > !samples).

compute errchk=3.

end if.

compute pars={!a;!sea;!b;!seb;!covab;!samples;!conf}.
```

```
print pars/title="*** Input Data ***"/rlabels="a:", "SE(a):", "b:","SE(b):", "COV(ab):",
"Samples:", "Conf:"/format = F8.4.

do if (errchk=0).

compute mns={make(!samples,1,!a),make(!samples, 1, !b)}.

compute x1=sqrt(-2*ln(uniform(!samples,2)))&*cos((2*3.14159265358979)*

 uniform(!samples,2)).

compute x1=(x1*chol(r))+mns.

compute ab=x1(:,1)&*x1(:,2).

compute x1={x1,ab}.

compute abtmp=ab.

compute abtmp(GRADE(ab))=ab.

compute ab=abtmp.

save x1/outfile=*/variables=a b ab.

compute mc={(!a*!b), ab(cilow,1), ab(cihigh,1)}.

print mc/title="**** Monte Carlo Confidence Interval ****"/clabels="ab", "LLCI",
"ULCI"/format = F8.4.

end if.

do if (errchk=1).

print/title="ERROR: Standard errors must be positive".

else if (errchk=2).

print/title="ERROR: Entered covariance is not compatible with the standard errors of a
and b".
```

```
else if (errchk=3).

print/title="ERROR: Number of samples is too small for this level of confidence".

end if.

end matrix.

restore.

!enddefine.


*WITHIN-PERSON*

mcmed a=-0.31/b=0.55/sea=0.06/seb=0.59.


*CROSS-PARTNER*

mcmed a=-0.31/b=0.53/sea=0.06/seb=0.59.
```

Predicting Sexual Satisfaction Over One Year from Negative Externalizing Emotional Expressions and Constructive Communication Behaviours

6A. Syntax for pooled analysis (gender differences were significant and this analysis was not reported in the paper):

```
*Step 1: Emotion --> QSIpositive (PATH C)

MIXED QSIpositive WITH NegExEm_c P_NegExEm_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_NegExEm_c NegExEm_c
```

```
  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).


*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH NegExEm_c P_NegExEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= P_NegExEm_c NegExEm_c

  /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> QSIpositive (PATH B)

MIXED QSIpositive WITH IndivCommunication_c P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= TimeYears P_IndivCommunication_c IndivCommunication_c

  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

*STEP 4: Emotion --> QSIpositive controlling for Communication (PATH C')

MIXED QSIpositive WITH NegExEm_c P_NegExEm_c IndivCommunication_c P_IndivCommunication_c TimeYears

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= TimeYears P_NegExEm_c P_IndivCommunication_c NegExEm_c IndivCommunication_c

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

6B. Syntax testing for gender differences:

*STEP 1: Emotion --> QSIpositive (PATH C)

MIXED QSIpositive WITH Gender NegExEm_c P_NegExEm_c TimeYears

/CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

/FIXED= Gender TimeYears P_NegExEm_c NegExEm_c TimeYears*Gender P_NegExEm_c*Gender NegExEm_c*Gender

/RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

/PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).

```
*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH Gender NegExEm_c P_NegExEm_c

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender P_NegExEm_c NegExEm_c P_NegExEm_c*Gender
NegExEm_c*Gender

   /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> QSIpositive (PATH B)

MIXED QSIpositive WITH Gender IndivCommunication_c P_IndivCommunication_c
TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_IndivCommunication_c IndivCommunication_c
TimeYears*Gender P_IndivCommunication_c*Gender IndivCommunication_c*Gender

   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 4: Emotion --> QSIpositive controlling for Communication (PATH C')

MIXED QSIpositive WITH Gender NegExEm_c P_NegExEm_c IndivCommunication_c
P_IndivCommunication_c TimeYears

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Gender TimeYears P_NegExEm_c P_IndivCommunication_c NegExEm_c
IndivCommunication_c TimeYears*Gender P_NegExEm_c*Gender
P_IndivCommunication_c*Gender NegExEm_c*Gender IndivCommunication_c*Gender

  /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

   /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

6C. Syntax for unpooled analysis:

```
*STEP 1: Emotion --> QSIpositive (PATH C)

MIXED QSIpositive WITH NegExEm_c P_NegExEm_c TimeYears Man Woman

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Man TimeYears*Man P_NegExEm_c*Man NegExEm_c*Man Woman
TimeYears*Woman P_NegExEm_c*Woman NegExEm_c*Woman |NOINT

   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 2: Emotion --> Communication (PATH A)

MIXED IndivCommunication_c WITH NegExEm_c P_NegExEm_c Man Woman

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Man P_NegExEm_c*Man NegExEm_c*Man Woman P_NegExEm_c*Woman
NegExEm_c*Woman |NOINT

   /RANDOM= Intercept | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID) COVTYPE(CSH).


*STEP 3: Communication --> QSIpositive (PATH B)

MIXED QSIpositive WITH IndivCommunication_c P_IndivCommunication_c TimeYears
Man Woman

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Man TimeYears*Man P_IndivCommunication_c*Man
IndivCommunication_c*Man Woman TimeYears*Woman
P_IndivCommunication_c*Woman IndivCommunication_c*Woman |NOINT

   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).
```

```
*STEP 4: Emotion --> QSIpositive controlling for Communication (PATH C')

MIXED QSIpositive WITH NegExEm_c P_NegExEm_c IndivCommunication_c
P_IndivCommunication_c TimeYears Man Woman

  /CRITERIA=CIN(95) MXITER(10000) MXSTEP(50) SCORING(10)
SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0,
ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)

  /FIXED= Man TimeYears*Man P_NegExEm_c*Man P_IndivCommunication_c*Man
NegExEm_c*Man IndivCommunication_c*Man

  Woman TimeYears*Woman P_NegExEm_c*Woman
P_IndivCommunication_c*Woman NegExEm_c*Woman IndivCommunication_c*Woman
|NOINT

   /RANDOM= Intercept TimeYears | SUBJECT(CoupleID) COVTYPE(VC)

  /PRINT=SOLUTION TESTCOV COVB

/REPEATED= Obs | SUBJECT(CoupleID*TimePoint) COVTYPE(CSH).



* Encoding: UTF-8.

/* This macro generates a Monte Carlo confidence interval */.

/* for the indirect effect in statistical mediation analysis */.

/* See Appendix B in http://www.guilford.com/p/hayes3 */.

/* for instructions on its use */.

/* Written by Andrew F Hayes */.

/* www.afhayes.com */.
```

```
define mcmed (a=!charend ('/') !default(0)/b=!charend ('/') !default(0)
 /sea=!charend('/') !default(1)/seb=!charend('/') !default(1)
 /samples=!charend ('/') !default(10000)/covab=!charend ('/')
 !default(0)/conf=!charend ('/') !default(95)).
preserve.
set printback=off.
matrix.
compute r={(!sea)*(!sea),!covab;!covab,(!seb)*(!seb)}.
compute errchk=0.
do if (det(r) <= 0).
compute errchk=2.
end if.
do if (!seb <= 0 or !sea <=0).
compute errchk=1.
end if.
compute cilow=((100-!conf)/200).
compute cihigh=1-cilow.
compute cilow=trunc(!samples*cilow).
compute cihigh=trunc((!samples*cihigh)+.999)+1.
do if (cilow < 1 or cihigh > !samples).
compute errchk=3.
```

```
end if.

compute pars={!a;!sea;!b;!seb;!covab;!samples;!conf}.

print pars/title="*** Input Data ***"/rlabels="a:", "SE(a):", "b:","SE(b):", "COV(ab):",
"Samples:", "Conf:"/format = F8.4.

do if (errchk=0).

compute mns={make(!samples,1,!a),make(!samples, 1, !b)}.

compute x1=sqrt(-2*ln(uniform(!samples,2)))&*cos((2*3.14159265358979)*

 uniform(!samples,2)).

compute x1=(x1*chol(r))+mns.

compute ab=x1(:,1)&*x1(:,2).

compute x1={x1,ab}.

compute abtmp=ab.

compute abtmp(GRADE(ab))=ab.

compute ab=abtmp.

save x1/outfile=*/variables=a b ab.

compute mc={(!a*!b), ab(cilow,1), ab(cihigh,1)}.

print mc/title="**** Monte Carlo Confidence Interval ****"/clabels="ab", "LLCI",
"ULCI"/format = F8.4.

end if.

do if (errchk=1).

print/title="ERROR: Standard errors must be positive".

else if (errchk=2).
```

```
print/title="ERROR: Entered covariance is not compatible with the standard errors of a
and b".

else if (errchk=3).

print/title="ERROR: Number of samples is too small for this level of confidence".

end if.

end matrix.

restore.

!enddefine.



*FEMALE WITHIN-PERSON*

mcmed a=-0.61/b=-0.66/sea=0.08/seb=1.50.



*MALE WITHIN-PERSON*

mcmed a=-0.70/b=-0.03/sea=0.11/seb=1.23.



*MALE --> FEMALE SEX SAT*

mcmed a=-0.70/b=0.19/sea=0.11/seb=1.25.



*FEMALE --> MALE SEX SAT*

mcmed a=-0.61/b=1.03/sea=0.08/seb=1.47.
```