Measuring Sexual Communication in Adolescent Dating Relationships in Vietnam: Development and Validation of the Sexual Communications Scales for Attitudes, Self-Efficacy, and Behavior

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ABSTRACT

Sexual communication improves relationship quality and the sexual and reproductive health of both partners. Much of the research on sexual communication among adolescents has been conducted in settings of the Global North and focuses narrowly on sexual health and condom use. Building on prior measures of sexual communication, we developed a set of three scales to measure sexual communication attitudes, self-efficacy, and behavior in adolescent dating relationships and administered the measures to 793 first-year male undergraduates 18–24 years in Hanoi, Vietnam. We used factor analysis to explore and confirm factor structure and assess invariance across relationship history and over time, suggesting a seven-item, two-factor attitudes scale and five-item, unidimensional scales for efficacy and behavior. Participants reported positive attitudes toward sexual communication, with low-to-moderate self-efficacy and behavior. All scales showed good convergent and discriminant validity. These related measures may be useful for identifying individual attitudes, self-efficacy, and behavior relevant to sexual violence prevention programming for adolescents.

KEYWORDS

Vietnam; adolescent dating; sexual communication; scale development; measurement invariance

Introduction

Sexual communication encompasses a broad range of verbal and nonverbal communication around sexual preferences, sexual history, sexual consent, and health behaviors, and has been studied among married couples, sexual partners, parents and children, and peers (Noar et al., 2006; Widman et al., 2014). In relationships, sexual communication can improve the sexual and reproductive health of both partners, as well as the quality of the relationship; specifically, more frequent sexual communication is associated with more frequent contraceptive use, higher sexual satisfaction (Frederick et al., 2017), better sexual function (Mallory et al., 2019), and overall relationship quality (Cupach & Metts, 1995). Although miscommunication has been discredited as a justification for sexual assault (M. Beres, 2010; Muehlenhard et al., 2016), sexual communication also is an important factor in negotiations of consent.
A growing body of research in Vietnam and elsewhere suggests that heterosexual couples experience limitations on their ability to communicate openly with partners about sex, related to strict gender roles dictating that women play a passive role in sexual decision-making (Bui et al., 2010; Hong et al., 2010; Lewis et al., 2022; Quach, 2008). Beliefs that women should not be knowledgeable about sex, should not discuss sexual matters, and should allow their partners to “teach” them remain prevalent in Vietnam (Hong et al., 2010), even among young people (Quach, 2008). In one study from the Mekong Delta region, unmarried women expressed low self-efficacy in negotiations of consent and condom use, particularly those who endorsed more rigid gender roles (Bui et al., 2010). In addition, communication about sex between parents and children still is considered taboo in many parts of Vietnam (Bui, 2020; Gao et al., 2012), and sex education in schools is focused primarily on avoidance of pregnancy and STIs (Do et al., 2017). While women are discouraged from discussing sex and contraception, beliefs among men that contraception is the female partner’s responsibility remain prevalent (Nguyen & Hoang, 2002). Youth make up a large portion of individuals seeking abortion services in Vietnam, yet very few adolescents seeking abortion report using modern contraception (Vinh & Tuan, 2015). Attitudes toward premarital sex remain largely negative, despite evidence that more young people are engaging in sex before marriage (Do & Fu, 2010). As a result of these sociocultural factors, many adolescents report poor communication with sexual partners, even in urban areas (Lewis et al., 2022). There is a clear need to promote better communication around sexual consent and reproductive health behaviors among young people, yet to date, no measure of sexual communication has been validated for Vietnam.

The benefits of sexual communication among adult married couples are well-studied, yet research among adolescents has some important limitations. First, it focuses narrowly on condom use (Noar et al., 2006). A meta-analysis of 55 studies, of which 18 occurred in adolescent populations, confirmed a link between condom use and safer sexual communication, defined as “discussing safer sex with a partner as a type of informational exchange” including discussions of contraception, sexual history, and sexually transmitted infections (STIs; Noar et al., 2006). Past communication behavior had the greatest effect size, with self-efficacy to communicate about sex and behavioral intention exhibiting smaller effects on condom use (Noar et al., 2006). Second, in addition to a narrow sexual health focus, most studies on sexual communication involving adolescents have considered communication with parents (Noar et al., 2006), with one study finding a positive association between the frequency of sexual health communication with parents and sexual communication self-efficacy with partners (Quinn-Nilas et al., 2016). The few studies that have explored adolescent communication with dating partners (Widman et al., 2014, 2006) have found a relationship between more general sexual communication and better sexual health decision-making, including more frequent contraceptive use (Polit-O’Hara & Kahn, 1985; Widman et al., 2006). One study found that self-silencing, or “the extent to which people avoid communicating their thoughts and feelings about issues that create conflict or discomfort to preserve their relationships,” among young women was associated with poorer sexual communication (Widman et al., 2006).

In the context of these limitations, the narrow sexual health focus of much of literature on adolescent sexual communication still has produced a number of scales designed to measure communication around sexual health among adolescents (Table S1). For example,
the Partner Communication Scale, validated among adolescent African American women, measures the frequency of sexual health communication behaviors with male partners (Milhausen et al., 2007). A related measure, developed by the same team, measures five dimensions of communication self-efficacy, including positive sexual messages, condom negotiation, and contraceptive communication (Quinn-Nilas et al., 2016). The Health Protective Sexual Communication Scale, validated in adolescent populations in the US, measures sexual health communication behaviors with a first-time sexual partner, current or past (Catania, 2011a), yet maintains the same narrow health focus.

While measures of more general sexual communication have been developed and validated, albeit in Global North settings, many of these scales originally were validated in samples of married adults. Thus, they measure perceptions of sexual communication quality in an existing committed relationship rather than operationalizing the attitudes, self-efficacy, or past behaviors that have been identified in the literature as key predictors of future sexual communication in adolescents (Noar et al., 2006). A commonly-used example is the Dyadic Sexual Communication Scale, a 13-item scale measuring participants’ perceptions of the quality of sexual communication occurring within a committed partnership (Catania, 2011b). While this scale has been validated subsequently in diverse populations, including adolescents, its relationship-specific items are a limitation for use among adolescents, who may not yet have begun to engage in dating relationships, or who may engage in more short-term partnerships.

Studies of sexual consent highlight important ways in which sexual communication may differ between adolescents and adults (Muehlenhard et al., 2016). Findings from these studies suggest that adolescents most often rely on nonverbal means to communicate consent in heterosexual sexual encounters (M. A. Beres, 2007; Lewis et al., 2022). While some research suggests that women rely on verbal communication of consent more often than men do (Jozkowski et al., 2014), men and women are able to recognize and accurately interpret nonverbal consent and refusal (M. Beres, 2010; Muehlenhard et al., 2016). A 2018 study of college men in the US found that assertive sexual communication was associated with positive attitudes about consent (Shafer et al., 2018). However, much of the literature on sexual communication and consent is based on consent negotiation during casual sexual encounters, and consent negotiation in the context of adolescent dating relationships is understudied (Muehlenhard et al., 2016), possibly reflecting the preponderance of literature from the Global North and a focus on majority-White US college populations. Scale measures developed to measure knowledge and attitudes about consent in these populations include the Sexual Consent Scale (Humphreys & Brousseau, 2010), which contains item subsets that reference sexual communication attitudes and behaviors. A major limitation of these existing scales is their common focus on verbal communication, despite evidence that nonverbal communication is more prevalent among adolescents (especially young men) during negotiations of consent (M. A. Beres, 2007).

A review of existing scales related to sexual communication clarified the need for a measure of sexual communication that (1) is relevant to youth in Vietnam; (2) is not narrowly focused on sexual health and condom use; (3) can be administered regardless of current relationship status; (4) encompasses attitudes, self-efficacy, and behavior; and (5) addresses nonverbal and reciprocal communication. We selected attitudes, self-efficacy, and past behavior as key dimensions of sexual communication specifically because they are most often studied as predictors of future sexual behavior, and therefore, are targeted in interventions to improve sexual communication (Noar et al., 2006), particularly among adolescents (Rogers, 2017).
We drew upon the existing scales and item sets reviewed above, guided by formative data from the parent study, to compile and validate a set of complementary communication measures appropriate for research among young people in Vietnam, henceforth referred to as the Sexual Communication Scale-Attitudes (SCS-A), the Sexual Communication Scale-Self-efficacy (SCS-E), and the Sexual Communication Scale-Behavior (SCS-B).

**Methods**

**Overview**

The research team designed scale measures of sexual communication attitudes, self-efficacy, and behavior as part of a parent study to adapt and test the effects of a web-based educational entertainment program to prevent sexual violence and to promote prosocial bystander behavior among men attending two universities in urban Vietnam (Yount et al., 2020). The Institutional Review Boards of Emory University [IRB00099860] and Hanoi University of Public Health [439/2019/YTCC-HD3] approved the parent study.

**Recruitment**

In partnership with university administrators, the Vietnam team identified a census of students from departments covering 85% to 90% of all matriculating male students at two universities in Hanoi, Vietnam. In total, 802 students matriculating the two universities (henceforth referred to as Universities 1 & 2) in September 2019 were recruited as part of the *GlobalConsent* study (Yount et al., 2020), designed to assess the impact of a sexual violence prevention program. The *GlobalConsent* program, based on social cognitive theory (Bandura, 2004), included a 30-minute learning module aimed at improving sexual communication attitudes and self-efficacy as mediators of sexual communication behavior and active consent-seeking (Yount et al., 2020). Eligible students were men self-identifying as heterosexual or bisexual, because the study focused on sexual violence against women, and in the first year of their program of study. We also limited eligibility to those between the ages of 18 and 24 years, as our population of interest was adolescents and young adults. Although the current study focused primarily on dating relationships, we did not exclude married participants.

Overall participation was 99% at baseline, with 99.7% of eligible students at University 1 and 98.5% of eligible students from University 2 consenting to participate. Nine students who completed the questionnaire were later found to be ineligible, bringing the eligible sample to 793. Seven hundred ninety-one and 786 students had complete data for the SCS-A and for the SCS-E, respectively. A total of 216 students reported being in a dating relationship in the past 3 months, 215 of whom had complete data for the SCS-B. Because of very low levels of missingness in the sample, those with missingness on all items in a particular scale were excluded via listwise deletion (Kang, 2013).

**Measures**

Item development was guided by themes that arose from formative qualitative data from the parent study, including interviews with male (n = 12) and female (n = 9) college students about sexual consent, sexual violence, and norms related to sex and dating, as well as focus
group discussions (n = 12) with college men (n = 69) describing their impressions of a sexual violence prevention program (Yount et al., 2020). The study team developed 15 items to assess three dimensions of sexual communication: attitudes, self-efficacy, and behavior. Many of the findings from formative data confirmed themes from the literature on adolescent sexual communication in Vietnam, namely (1) young men were expected to take a more active “pursuer” role while women were expected to take a passive one, and (2) young men were able to recognize women’s nonverbal refusal but sometimes discounted or ignored this refusal. Thus, we selected or created items that reflected salient themes from the formative data: direct/verbal versus indirect/nonverbal communication and reciprocal exchange between partners. We prioritized items validated among adolescent or college populations (Quinn-Nilas et al., 2016), used or validated in settings in the Global South (Kaufman et al., 2012), and of relevance to Vietnamese adolescents in university. Where existing items did not cover themes from formative data, we adapted text from qualitative transcripts to create new items.

Based on discussions with the study team, some items from prior scales were reworded for clarity and relevance to the Vietnamese context before translation. The final 10-item set for attitudes included one item adapted from the Sexual Consent Scale-Revised (Humphreys & Brousseau, 2010), two items pulled directly from a sexual communication attitudes scale developed for the “Let’s Talk” sexual education program in Nepal (Kaufman et al., 2012), and seven items derived from the qualitative data. The five self-efficacy and behavior items included two items adapted from the Sexual Communication Self-efficacy Scale/the Sexual Assertiveness Questionnaire (Loshek & Terrell, 2015; wording was similar across both measures), one item adapted from the “Let’s Talk” sexual education program in Nepal (Kaufman et al., 2012), one item adapted from the Sexual Communication Satisfaction Inventory (Wheeless et al., 1984), and one new item derived from qualitative interviews.

After translating the item set, researchers in Vietnam cognitively tested the scales with a group of eight male university students. Participants individually evaluated each item for relevance and clarity, and this individual feedback was discussed in a focus group to formulate suggestions for improvement. Minor modifications to certain items were then made in Vietnamese, and the scales were back-translated to English to ensure accuracy of translation. For the SCS-A items (Table 1a), participants indicated how much they agreed or disagreed using a 5-point Likert scale ranging from strongly agree (1) to strongly disagree (5). Due to sparse data in some categories, “strongly agree” and “agree” were collapsed into a single category, as were “strongly disagree” and “disagree.” Some items were reverse coded to maintain a common valence, with higher scores indicating a more positive attitude toward sexual communication.

Self-efficacy and behavior were measured using the same five item stems (Table 1b and Table 1c). Self-efficacy was assessed by asking how confident the participant felt with respect to each statement about communication (0 = not at all, 1 = somewhat, 2 = very). Behavior was assessed by asking how frequently the participant used each type of communication (0 = never, 1 = occasionally, 2 = often, 3 = always). “Often” and “always” were collapsed to accommodate sparseness in the “always” category. Sexual communication behavior items were asked only of participants who indicated that they had been in a romantic or dating relationship in the prior 3 months.
In addition to sexual communication, participants answered questionnaire modules on sexually violent behavior, sexual-violence knowledge, sexual-consent knowledge, gender-role attitudes, beliefs about rape myths, rape empathy, and bystander attitudes, efficacy, and behavior. All modules were adapted from existing, validated modules (Yount et al., 2020). Of these, sexual violence knowledge, sexual consent knowledge, gender-role attitudes, and rape-myth attitudes were used in this analysis; their numbers of items, alpha reliabilities, response options, example items, and the validated measures from which they were adapted are summarized in Table S2. Demographic variables collected included age, program of study, relationship status, living situation, religion, ethnicity, and sexual orientation.

**Data Collection and Management**

Baseline survey data collection occurred in September of 2019 at each university. Participants self-administered the survey on tablets using REDCap mobile app software and were compensated 100,000 VND (about 4 USD). Participants self-administered the same three measures six to seven months post-baseline via REDCap online survey. Each
| Item                                                                 | Derived from                                                                 | Not confident (%) | Somewhat confident (%) | Very confident (%) | Mean | SD  | Missing |
|----------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------|------------------------|--------------------|------|-----|---------|
| Talking about sex with a dating partner.                           | Let's Talk (Kaufman et al., 2012)                                            | 48.05             | 43.00                  | 8.95               | 0.61 | 0.65 | 0       |
| Talking about other sexual activity, such as touching, hugging, kissing, etc., with a dating partner. | Developed for study from formative data                                        | 24.62             | 57.32                  | 18.06              | 0.93 | 0.65 | 1       |
| Disclosing personal thoughts and information, including about sex, with a dating partner. | Sexual Communication Satisfaction Inventory (Wheeless et al., 1984)            | 34.17             | 49.68                  | 16.14              | 0.82 | 0.69 | 0       |
| Telling my dating partner if I want to have sex.                   | Sexual Communication Self-efficacy Scale (Quinn-Nilas et al., 2016)           | 48.99             | 38.23                  | 12.78              | 0.64 | 0.70 | 3       |
| Saying no to my dating partner if I don’t want to have sex.        | Sexual Communication Self-efficacy Scale (Quinn-Nilas et al., 2016)           | 18.12             | 40.05                  | 41.83              | 1.24 | 0.74 | 4       |
**Table 1c.** Distribution of SCS-B items among Vietnamese university men (n = 793).

| Item                                                                 | Derived from                                                                 | Never (%) | Sometimes (%) | Often/always (%) | Mean  | SD   | Missing |
|----------------------------------------------------------------------|------------------------------------------------------------------------------|-----------|---------------|-------------------|-------|------|---------|
| Talking about sex with a dating partner.                            | Let’s Talk (Kaufman et al., 2012)                                            | 35.19     | 53.24         | 11.57             | 0.76  | 0.64 | 0       |
| Talking about other sexual activity, such as touching, hugging, kissing, with a dating partner. | Developed for study from formative data                                        | 8.33      | 55.56         | 36.11             | 1.28  | 0.60 | 0       |
| Disclosing personal thoughts and information, including about sex, with a dating partner. | Sexual Communication Satisfaction Inventory (Wheeless et al., 1984)           | 24.07     | 50.46         | 25.46             | 1.01  | 0.71 | 0       |
| Telling my dating partner if I want to have sex.                   | Sexual Assertiveness Questionnaire (Loshek & Terrell, 2015)                  | 51.85     | 33.80         | 14.35             | 0.63  | 0.72 | 0       |
| Saying no to my dating partner if I don’t want to have sex.        | Sexual Assertiveness Questionnaire (Loshek & Terrell, 2015)                  | 52.56     | 28.37         | 19.07             | 0.67  | 0.80 | 1       |

A participant received an anonymous survey link via e-mail and responses were matched to baseline data via a unique identification number. Overall, 751 participants completed the second survey and were compensated 150,000 VND (about 6.50 USD).

**Sample**

The overwhelming majority of the 793 participants were ethnic majority Kinh, nonreligious, and heterosexual (Table S3). Fifty-three percent had never been in a sexual or romantic relationship, one-quarter were in a committed relationship at the time of interview, and one-fifth had been in a relationship in the past but were not in one at interview. Less than two percent described themselves as casually dating or married. Roughly half the sample had lived in Hanoi for at least one year before entering university, and almost half were studying health sciences.

**Analysis**

Descriptive analyses were performed in STATA (Version 16, StataCorp, College Station, TX). Exploratory and confirmatory factor analyses (EFA/CFA) were performed sequentially in MPlus using a random split-half sample for the SCS-A and the SCS-E. Due to the small number of respondents that reported being in a relationship in the past three months and the fact that item stems had been validated with the self-efficacy response options, the researchers elected to use a full sample, rather than a split-half, for confirmatory analysis of the SCS-B. Model fit for all three scales was assessed using the chi-square statistic, Root Mean Square Error of Approximation (RMSEA) ≤ 0.06, Comparative Fit Index (CFI) ≥ 0.95, and Tucker-Lewis Index (TLI) ≥ 0.95 (Pett et al., 2003). Items were dropped at the EFA stage based on four considerations: theoretical relevance to the construct, factor loading below 0.35, overall impact on fit statistics, and modification indices (Pett et al., 2003). These criteria were relaxed where items that did not load at 0.35 or higher were considered conceptually important. We compared one- and two-factor models for the SCS-A, resulting in a total of four one-factor
models (7–10 items) and four two-factor models (7–10 items). For the SCS-E and SCS-B, respectively, only single-factor models were considered, due to the relatively small number of items and our guideline of having at least three items per factor (Pett et al., 2003).

Measurement invariance (MI) testing for the SCS-A and SCS-E was performed using a multi-group CFA (MGCFA) across relationship history (ever vs. never in a romantic or dating relationship; Muthén, 2015). Since all respondents to the SCS-B reported being in a relationship within the past three months, MI was tested across current vs. past relationship status. We used mean and variance adjusted weighted least squares estimators for all models, as is recommended for ordered categorical data (Muthén, 2015). To account for sampling design, we included university in all models as a cluster variable. Cross-time invariance testing was performed according to the method outlined for ordinal indicators in the Mplus Language Addendum using the delta parameterization (Muthén & Muthén, 2013). MI was assessed primarily through change in fit statistics based on established thresholds (ΔCFI≤0.01, ΔRMSEA≤0.01; Cheung & Rensvold, 2002), comparing nested models that examined configural invariance of model dimensionality, metric invariance of model factor loadings, and scalar invariance of model intercepts.

| Table 2. Baseline comparison of item means in the SCS-A and SCS-E across ever vs. never relationship history and across current vs. past relationship status in the SCS-B, Vietnamese university men (n = 793). |
|-----------------------------------------------|------------------|------------------|---|
| SCS-A | Group Ever Mean (SD) | Group Never Mean (SD) | P |
| | | | | |
| Women are not supposed to talk about sex. | 1.78 (0.52) | 1.71 (0.56) |  |
| Talking about sex destroys the romance or heat of the moment. | 1.52 (0.69) | 1.33 (0.74) |  |
| If a woman kisses me, that means she wants to have sex with me. | 1.64 (0.61) | 1.65 (0.59) |  |
| If a woman and I have had sex before, the next time … I already have consent. | 1.56 (0.70) | 1.62 (0.65) |  |
| disclosing personal thoughts/information … about sex … with a dating partner. | 1.89 (0.48) | 1.90 (0.44) |  |
| Telling my dating partner if I want to have sex. | 1.87 (0.48) | 1.84 (0.50) |  |
| Saying no to my dating partner if I don’t want to have sex. | 1.81 (0.49) | 1.80 (0.49) |  |
| Factor 1 (Indirect/Nonverbal Communication) score | −0.11 (0.55) | −0.13 (0.55) | .5935 |
| Factor 2 (Direct/Verbal Communication) score | −0.03 (0.35) | −0.05 (0.35) | .3886 |
| SCS-E | Group Mean (SD) | Group Mean (SD) | P |
| | | | | |
| Talking about sex with a dating partner. | 0.78 (0.67) | 0.46 (0.59) |  |
| Talking about other sexual activity, such as … with a dating partner. | 1.09 (0.63) | 0.80 (0.64) |  |
| Disclosure personal thoughts/information … about sex … with a dating partner. | 0.90 (0.70) | 0.75 (0.69) |  |
| Telling my dating partner if I want to have sex. | 0.71 (0.73) | 0.58 (0.67) |  |
| Saying no to my dating partner if I don’t want to have sex. | 1.29 (0.71) | 1.19 (0.76) |  |
| Factor score | 0.19 (0.75) | −0.13 (0.70) | .001 |

| SCS-B | Group Mean (SD) | Group Mean (SD) | P |
| | | | | |
| Talking about sex with a dating partner. | 0.78 (0.64) | 0.72 (0.65) |  |
| Talking about other sexual activity, such as … with a dating partner. | 1.28 (0.59) | 1.27 (0.65) |  |
| Disclosure personal thoughts/information … about sex … with a dating partner. | 1.00 (0.69) | 1.05 (0.75) |  |
| Telling my dating partner if I want to have sex. | 0.67 (0.73) | 0.53 (0.71) |  |
| Saying no to my dating partner if I don’t want to have sex. | 0.69 (0.78) | 0.62 (0.78) |  |
| Factor score | 0.02 (0.55) | −0.22 (0.52) | .5833 |
We assessed discriminant validity using Pearson’s correlation coefficient of the derived factor scores. From the parent study, we selected sex-related attitudinal (rape-myths and gender-roles) scales as well as the knowledge (sexual consent and sexual violence legality) scales to assess discriminant validity, hypothesizing that these would be weakly to moderately correlated with sexual communication attitudes, as they measure related but distinct constructs. We also hypothesized that these four scales would be more weakly correlated with self-efficacy and behavior than attitudes, since they are conceptually more distant. We could not assess convergent validity, as no other scales directly measuring sexual communication were administered.

**Results**

**Univariate Statistics**

Participant responses indicated positive attitudes toward direct verbal sexual communication, with the three items describing direct verbal communication having the highest mean scores (Table 1a). Item means ranged from 1.03–1.85 out of 2. All items had a strong negative skew after reverse coding more positive attitudes as higher scores. The most endorsed item was “Listening to a woman’s expectations about sex can help avoid assumptions in a sexual relationship” at 89%, while the least endorsed item was “Women are not supposed to talk about sex,” with which 79% of participants disagreed. There were no significant differences in factor scores across relationship history (Table 2).

Reported self-efficacy and behavior were low to moderate (Tables 1b, 1c). Item means ranged from 0.61 to 1.24 (out of 2) and from 0.63 to 1.28 (out of 2), respectively. Participants reported the highest self-efficacy for “saying no to my dating partner if I don’t want to have sex,” although this behavior was reported least among the subsample who provided responses on the SCS-B. Reported self-efficacy on the remaining items was lowest for “talking about sex with a dating partner” and “telling my dating partner I want to have sex.” Among those in a relationship within the past three months, over 90% reported talking to partners about other sexual activities, including kissing and hugging, at least sometimes. In comparison, only 65% of participants reported talking to dating partners about sex. Factor-score means were significantly higher for those with past relationship history for the reported self-efficacy, but no significant differences in behavior were observed across groups.

**Factor Structure and Model Fit**

The best-fitting EFA revealed a seven-item, two-factor attitudes scale with factors describing direct/verbal (3 items) and indirect/nonverbal (4 items) communication, correlated at 0.34. The direct communication items reflected favorable attitudes toward reciprocal

| Scale | RMSEA [90% CI] | CFI | TLI | Range of standardized factor loadings |
|-------|----------------|-----|-----|---------------------------------------|
| SCS-A | 0.058 [0.031, 0.085] | 0.974 | 0.959 | Indirect: 0.756–0.969; Direct: 0.332–0.670 |
| SCS-E | 0.057 [0.008–0.101] | 0.999 | 0.998 | 0.385–0.907 |
| SCS-B | 0.149 [0.099–0.204] | 0.999 | 0.999 | 0.434–0.891 |
Table 4. Results of measurement invariance testing for the SCS-A, SCS-E, and SCS-B.

|                | SCS-A                | SCS-B                | SCS-E                |
|----------------|----------------------|----------------------|----------------------|
| **Relationship** |                      |                      |                      |
|                 | χ²                   | df                   | p                    | RMSEA | CFI | TLI | ΔCFI | ΔRMSEA |
| **Stability**   |                      |                      |                      |       |    |    |      |         |
| Configural      | 66.000               | 26                   | <.0001               | 0.062 | 0.995 | 0.992 |
| Metric          | 73.794               | 31                   | <.0001               | 0.059 | 0.995 | 0.993 |
| Scalar          | 80.379               | 36                   | <.0001               | 0.056 | 0.995 | 0.994 |
| Metric vs. configural | 15.851 | 5                   | .003                 | 0.000 | −0.003 |
| Scalar vs. configural | 20.726 | 10                  | .0231                | 0.000 | −0.006 |
| Scalar vs. metric | 5.505               | 5                   | .3574                | 0.000 | −0.003 |
| **Longitudinal**|                      |                      |                      |       |    |    |      |         |
| Configural      | 752.875              | 71                   | <.0001               | 0.113 | 0.972 | 0.964 |
| Metric          | 772.304              | 76                   | <.0001               | 0.110 | 0.971 | 0.965 |
| Scalar          | 813.536              | 83                   | <.0001               | 0.108 | 0.970 | 0.967 |
| Metric vs. configural | 85.308  | 5                   | <.0001               | 0.001 | −0.005 |
| Scalar vs. configural | 173.072 | 12                  | <.0001               | 0.002 | −0.006 |
| Scalar vs. metric | 355.472             | 7                   | <.0001               | 0.001 | −0.002 |
| SCS-E           |                      |                      |                      |       |    |    |      |         |
| **Relationship** |                      |                      |                      |       |    |    |      |         |
|                 | χ²                   | df                   | p                    | RMSEA | CFI | TLI | ΔCFI | ΔRMSEA |
| **Stability**   |                      |                      |                      |       |    |    |      |         |
| Configural      | 23.879               | 10                   | .0079                | 0.084 | 1.000 | 1.000 |
| Metric          | 26.124               | 14                   | .0250                | 0.066 | 1.000 | 1.000 |
| Scalar          | 29.559               | 18                   | .0420                | 0.057 | 1.000 | 1.000 |
| Metric vs. configural | 5.232               | 4                   | .2643                | 0.000 | −0.018 |
| Scalar vs. configural | 9.527               | 8                   | .2998                | 0.000 | −0.027 |
| Scalar vs. metric | 4.826               | 4                   | .3056                | 0.000 | −0.009 |
| **Longitudinal**|                      |                      |                      |       |    |    |      |         |
| Configural      | 74.183               | 34                   | .0001                | 0.040 | 0.995 | 0.993 |
| Metric          | 82.069               | 38                   | <.0001               | 0.039 | 0.995 | 0.994 |
| Scalar          | 88.714               | 43                   | .0001                | 0.038 | 0.994 | 0.994 |
| Metric vs. configural | 28.975               | 4                   | <.0001               | 0.000 | −0.001 |
| Scalar vs. configural | 32.573               | 9                   | .0002                | 0.001 | −0.002 |
| Scalar vs. metric | 10.828               | 5                   | .0549                | 0.001 | −0.001 |
| SCS-B           |                      |                      |                      |       |    |    |      |         |
| **Relationship** |                      |                      |                      |       |    |    |      |         |
|                 | χ²                   | df                   | p                    | RMSEA | CFI | TLI | ΔCFI | ΔRMSEA |
| **Stability**   |                      |                      |                      |       |    |    |      |         |
| Configural      | 59.366               | 10                   | <.0001               | 0.214 | 0.998 | 0.996 |
| Metric          | 51.568               | 14                   | <.0001               | 0.158 | 0.999 | 0.998 |
| Scalar          | 56.701               | 18                   | <.0001               | 0.141 | 0.999 | 0.998 |
| Metric vs. configural | 2.656               | 4                   | .6169                | 0.001 | −0.056 |
| Scalar vs. configural | 11.348               | 8                   | .1828                | 0.001 | −0.073 |
| Scalar vs. metric | 9.684               | 4                   | .0461                | 0.000 | −0.017 |
| **Longitudinal**|                      |                      |                      |       |    |    |      |         |
| Configural      | 58.059               | 34                   | .0062                | 0.050 | 0.999 | 0.999 |
| Metric          | 64.357               | 38                   | .0048                | 0.049 | 0.999 | 0.999 |
| Scalar          | 74.557               | 43                   | <.0001               | 0.051 | 0.999 | 0.999 |
| Metric vs. configural | 22.206               | 4                   | .0002                | 0.001 | 0.000 |
| Scalar vs. configural | 40.096               | 9                   | <.0001               | 0.001 | 0.000 |
| Scalar vs. metric | 28.086               | 5                   | <.0001               | 0.002 | 0.000 |

communication, including asking about a partner’s expectations. The indirect/nonverbal factor featured assumptions and possible miscommunication based on nonverbal cues. We dropped three items during the EFA due to poor loadings and theoretical concerns. “Men should know more about sex than women” measured gender norms related to sex, but not explicitly related to communication. “If a woman pushes my hand away from her, she doesn’t want me to continue touching her” measured an appropriate interpretation of nonverbal cues and did not align with the content of other items in the factor, which generally referenced assumptions based on nonverbal cues. “If a woman refuses sex at first, she doesn’t actually mean no, and I should keep trying” was double-barreled and therefore open to varying interpretations. The efficacy and behavior scales were unidimensional, since
five items would be insufficient for content validity across two factors (Pett et al., 2003). In general, model fit statistics (Table 3) indicated adequate fit to the data, except for the RMSEA (0.149) of the SCS-B.

**Measurement Invariance Across Relationship History**

In the SCS-A, negligible change (≤0.01) in SRMR, CFI, and RMSEA between the configural, metric, and scalar models suggested weak and strong factorial invariance (Table 4; Chen, 2007). Although the chi-square statistic was significant in the former two tests, this criterion has been criticized as subject to both Type I and Type II errors (Chen, 2007). Differences in CFI were similarly negligible for the SCS-E across all models with RMSEA improving with the imposition of additional constraints. For the SCS-B, the configural model showed poor fit based on RMSEA, which improved in the metric and scalar models. Overall, the majority of evidence for the SCS-A and SCS-E suggested equivalent measurement properties across groups with different relationship history.

**Measurement Invariance over Time**

The configural model of the SCS-A showed poor fit based on the RMSEA due to the item “Listening to a woman’s expectations about sex can help avoid assumptions in a sexual relationship” (Table 4). However, this item could not be dropped without altering the factor structure of the scale. Chi-square difference testing was significant for metric-configural and scalar-metric comparisons. RMSEA improved in the metric and scalar models, but not to acceptable values, and the change in fit statistics remained below recommended thresholds. The SCS-E and SCS-B showed significant chi-square differences, but changes in model fit remained negligible across configural, metric, and scalar models (ΔCFI≤0.001, ΔRMSEA≤0.002), with RMSEA improving in some cases. Overall, the weight of the evidence suggests that these scales are invariant over time.

**Correlations Among Scales**

Factor scores across the two dimensions of the SCS-A, direct/verbal and indirect/nonverbal communication, were highly correlated with each other, at 0.79 (Table S4). The two SCS-A factors were also moderately correlated with sex-related scales used in the study, attitudes about rape myths and knowledge of sexual consent (factor score correlation range 0.31–0.51), indicating that the scales measure related but distinct constructs. Less conceptually relevant constructs, such as gender role attitudes and knowledge of sexual violence legality, demonstrated only weak correlations (< 0.30) with the SCS-A. Moreover, SCS-A factors were uncorrelated (< 0.10) with sexual communication self-efficacy and behavior, suggesting that attitudes are distinct dimensions that are weakly related to self-efficacy and behavior. Sexual communication self-efficacy and behavior factor scores were moderately to highly correlated (0.58), and each was also uncorrelated with knowledge and attitudinal measures used in the parent study, confirming discriminant validity.
Discussion

We have validated a complementary set of scales to measure attitudes, self-efficacy, and behavior related to both sexual communication in a sample of 793 Vietnamese college men. Attitudes about verbal and nonverbal sexual communication were highly positive regardless of relationship history, while sexual communication self-efficacy and behavior were low to moderate and uncorrelated with attitudes. Those who reported having ever been in a dating relationship reported significantly higher self-efficacy than those who had not. SCS-B items were equally likely to be endorsed whether the participant reported a current or past relationship. Comparison of factor scores across groups also confirmed these findings.

Discriminant validity testing suggested that the SCS-A, SCS-E, and SCS-B measured distinct but related constructs. The relatively low correlation between participants’ attitudes versus their self-efficacy and behavior aligns with prior studies demonstrating a stronger link between self-efficacy and behavior (Noar et al., 2006). Moreover, moderate to low correlation of the attitudes scale with other sex-related measures of knowledge and attitudes used in the parent study suggests that the scale measures a distinct construct from related measures for rape myth attitudes and knowledge of active consent.

Measurement invariance testing confirmed that the three measures can be used regardless of a person’s current relationship status, although past relationship history is required for the behavior scale. The SCS-A and SCS-E also were invariant across relationship history, suggesting that these two scales exhibit comparable measurement properties across theoretically salient groups. The measurement properties of the SCS-E and SCS-B also remained invariant over the six-month time period between the first and second administrations of the scales. However, those of the SCS-A showed some evidence of non-invariance due to item “Listening to a woman’s expectations about sex can help avoid assumptions in a sexual relationship,” suggesting the potential need for refinement of item wording to track changes in attitudes about sexual communication more accurately over time.

Our set of measures complements existing sexual communication measures for adolescents, which to date have primarily focused on health-related communication with parents (Hutchinson, 2007; Somers & Canivez, 2003), including about STI risk and condom use. The SCS-A covers domains of verbal and nonverbal communication and includes items about reciprocal communication between partners. Our findings also add to sexual communication research more broadly by comparing dimensions of sexual communication across relationship history. The use of related measures using the same question stems also may have utility in identifying gaps between individual self-efficacy and behavior that may be relevant to programming aimed at adolescents. For example, we found that adolescents who had never been in a relationship reported significantly lower self-efficacy in sexual communication than the group with relationship experience. This finding, along with prior research suggesting that sexual communication self-efficacy predicts communication behavior in adolescent dating relationships (Leddy et al., 2016; Seth et al., 2009), indicates that programs aimed at increasing self-efficacy, especially in younger adolescents, may be effective at increasing desired behaviors. Improvements in general sexual communication may have the added benefit of increasing safer sex behaviors among adolescents, thereby decreasing the risks of STIs and unwanted pregnancy (Widman et al., 2006), in addition to promoting affirmative consent and preventing sexual violence. Importantly, two of the three scales can be used regardless of relationship status or history, adding to their utility in evaluating prevention
programs that target adolescents before they engage in sexual relationships. While modest refinement of one measure appears necessary, this study offers a previously absent, group-invariant, and contextually relevant set of measures of sexual communication in adolescent dating relationships for use in research and programming in Vietnam.

Limitations

The scale measures described in this analysis have been tested in a sample of college men at two universities in Hanoi, Vietnam. Therefore, while the findings may be generalizable to men at the two study sites, studies in other groups, including college women in Vietnam and college populations in other areas of Vietnam, are needed to confirm that these measures are valid and invariant in other demographic groups. Furthermore, the sample of participants that completed the behavioral items was substantially smaller than the full sample, which may have affected the model fit, and therefore, limited the conclusions that could be drawn from MI testing, particularly in the cross-sectional baseline sample. Validation of this scale should be repeated using a larger sample.

The measurement properties of the SCS-A scale showed some evidence of non-invariance over time, potentially due to the impact of the intervention on participants’ understanding of healthy communication and consent, and possibly due to the impact of the COVID-19 pandemic on data collection. While baseline data were collected in person at the study sites with facilitation by research assistants, post-intervention surveys were administered remotely via online survey due to COVID-19-related lockdown measures, and some non-invariance may have resulted from the different modes of data collection. Non-invariance over time also may have resulted from exposure to the intervention itself, which aimed to change attitudes related to sexual communication and may have influenced how participants interpreted these items. Future studies will refine this scale further to identify a set of items that retains similar measurement properties over time.

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Data Availability Statement

The data that support the findings of this study are available at https://figshare.com/articles/dataset/Sexual_Communication_Scales_SCS_Data/13954091.

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