Validation of a brief French version of the sexual anxiety scale

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Although sexual anxiety (SA) is associated with significant sexual and relationship difficulties, to date, we lack brief scales to adequately assess SA. The aim of the present study was to develop a brief and reliable French version of the Sexual Anxiety Scale (SAS) that can be used to screen the manifestations of SA and their severity. A community sample (n = 576) was recruited to investigate the reliability and validity of the brief form of the scale (SAS-BF). Confirmatory factor analysis was performed on the original three-factor model (SAS) and on the new, four-factor SAS-BF. Its convergent validity was tested with theoretically relevant correlates (e.g., anxiety, sexual satisfaction). The SAS-BF yielded strong psychometric properties in terms of factor structure and reliability, and was reasonably correlated with associated variables. SAS-BF can be considered a valid short scale to assess SA in studies where a brief form of the questionnaire is desirable or during clinical screening with patients experiencing variable levels of SA.

KEYWORDS: Brief questionnaire, erotophobia, factor analysis, sexual anxiety, validation

Difficulties with sexual functioning represent a common experience in adulthood (Graham et al., 2020; Lewis et al., 2010) and have been associated with lower sexual and relationship satisfaction, self-esteem, and quality of life (Flynn et al., 2016; Nappi et al., 2016). Sexual anxiety is defined as the tendency to experience worrisome thoughts, discomfort, fear, or avoidance when exposed to sexual contexts or cues (Fisher et al., 1988; Snell et al., 1993). In the current article, sexual anxiety (SA) is employed as an umbrella term for related conditions: sexual aversion (Crenshaw, 1985), sexual phobia (Kaplan, 1987), and erotophobia (Fisher et al., 1988).

Prevalence data suggest that SA is far from uncommon, even though epidemiological data are lacking. In a large internet survey (n = 4,147) about sexual health among a representative sample of adults (19–69 years of age) in the Netherlands, 30% of respondents had experienced SA at some point in their lives and about 4% met diagnostic criteria for Sexual Aversion Disorder (a recurrent and acute form of anxiety toward sexuality; Bakker & Vanwezenbeek, 2006). A more recent population-based study (n = 8,000), which focused on a representative sample of the Dutch population (aged 15–71 years), suggested that women are twice as likely to experience persistent SA (4.5%) when compared to men (2.4%; Kedde, 2012). Regarding sexual functioning, SA is associated with experiencing more sexual dysfunctions (e.g., difficulties related to sexual desire or pain during sexual intercourse; Brassard et al., 2015; Nelson & Purdon, 2011), increased sexual distress (Dang et al., 2018), and lower sexual satisfaction (Bigras et al., 2017; Fallis et al., 2011). SA is also related to poorer body image (Carter et al., 2020; La Rocque & Cioc, 2011) and lower sexual self-esteem (Brassard et al., 2015; Snell et al., 1993). Higher levels of SA are negatively correlated with risky sexual behaviours (Lafortune et al., 2020; Lewis et al., 2006) and sexual compulsivity (Elfati & Mikulincer, 2018). Moreover, the signs and symptoms of each individual with SA are distributed along a continuum ranging from lesser to greater severity; in severe form of SA, sexual stimuli may cause symptoms of extreme anxiety/panic, such as palpitations, shortness of breath, or nausea (Brotto, 2010). Although SA is associated with significant sexual and relational distress (Dang et al., 2018), measures of SA are currently limited and short scales to adequately assess SA are lacking, thus reflecting the need to develop measures meant to accurately screen manifestations of SA and its impacts on sexual satisfaction and functioning (Borg et al., 2014).

Sexual Anxiety Scale
Several scales have been developed to assess anxious or phobic responses to sexual cues (e.g., Fallis et al., 2011; Fisher et al.,

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Certain limitations, however, pertain to the SAS in its original form. Firstly, careful examination reveals that Factor 1 (23 items) contains distinct latent constructs (i.e., exposure to pornographic/erotic material, masturbation/sexual exploration and impersonal sexual experiences), suggesting that subdividing this factor could yield a stronger statistical model. Secondly, the SAS is lengthy (56 items) with somewhat redundant items. The use of brief scales is highly recommended both in clinical settings for quick screening purposes as well as in research, notably to maintain motivation when data collection involves numerous scales (Böhle et al., 2020; Godbout et al., 2016). From the targeted respondent perspective, completing long questionnaires about sexuality can represent significant exposure to sexual cues, leading to elevated distress among people with SA which may result in higher dropout rates. From the clinicians’ standpoint, notably by those working in the public sector where resources are often limited (e.g., high workload, limited time), it is necessary for evidence-based assessment to use tools with established reliability and validity metrics, that are straightforward and brief to administer (Beidas et al., 2015). Thirdly, there are no papers detailing the factorial structure of the SAS following a Confirmatory Factor Analysis. It is thus essential to develop a brief version of the SAS where each factor is comprised of a parsimonious selection of items per construct. Nevertheless, the SAS offers an adequate basis to develop a brief scale assessing SA, since it is based on a solid theoretical background (Fisher et al., 1988), provides a multidimensional screening of domains in which SA manifests, and demonstrates strong psychometric qualities across several original studies.

**Research Aims and Hypotheses**

The aim of the present study was to develop a brief and reliable scale that could assess different dimensions and manifestations of SA through the Sexual Anxiety Scale (SAS; Fallis et al., 2011), based on Fisher and colleagues’ (1988) well-known theoretical framework on SA. To achieve this, the first objective was to test a French translation of the original three-factor structure of the SAS (French SAS) in a French-Canadian sample issued from the general population. The second objective was to develop and test a brief form of the SAS (e.g., by eliminating redundant items) and compare its factorial structure (SAS-BF), internal consistency, and construct and discriminant validity (through relationships with variables associated with SA in previous studies). We hypothesized that: (1) higher SA would be negatively correlated with sexual satisfaction, sexual self-esteem, and sexual compulsivity, and positively associated with other measures of SA; (2) the SAS would be weakly or non-significantly associated with measures of nonspecific anxiety and neuroticism, suggesting that the total SAS score would not directly reflect general anxiety symptoms or emotional instability; (3) total and subscales scores of the original SAS would be strongly correlated with the corresponding scales of the SAS-BF. Considering previous studies on SA (e.g., Bigras et al., 2017; Keddie, 2012), gender differences were also explored for the SAS-BF total and subscale scores and the aforementioned correlates.
METHOD

Participants and Procedure
A non-probabilistic sample of 576 adults aged from 18–69 years, \( M = 36.82, SD = 11.78; 59.7\% \) female, 35.4\% male, 4.8\% non-binary) was recruited from the general population. Among participants, 71.8\% self-identified as heterosexual, 13.4\% as bisexual, 10.1\% as homosexual, 4.8\% pansexual, and 0.5\% as asexual. Most participants were French-Canadians (98.8\%). The majority was either currently employed (59.4\%) or studying (23.5\%). Regarding relationships, 49.4\% reported being in a relationship, 33.7\% being single, and 11.8\% married. To be included in analyses, participants had to have provided complete data on the SAS and the six scales used for its validation and be aged 18 and older. Although there is no single recommendation regarding appropriate sample size for factor analysis, larger sample provide more stable factor loadings (MacCallum et al., 1999) and 500 observations are considered an appropriate baseline to conduct robust factor analyses (Comrey & Lee, 1992).

Participants were recruited through social media (Facebook, Instagram) where they were invited to click on a link directing them to an online questionnaire hosted on the Qualtrics platform. Facebook advertising targeting strategies were deployed to increase the representativeness of certain subgroups (e.g., men, 18–25-year-old adults). To participate, individuals had to be 18 years or older and have a sufficient knowledge of French to complete the questionnaire. The survey included a sociodemographic section, the French translation of the SAS, and six relevant scales or subscales required to establish construct validity (detailed below). The questionnaire took about 20 to 40 minutes to complete. The study was approved by the Institutional Ethics Review Board of the Université du Québec à Montréal (certificate number: 4025_e_2020).

Validation Questionnaires
Multidimensional Sexuality Questionnaire (MSQ; Snell et al., 1993). Two five-item subscales from the French MSQ (Brassard et al., 2015) were used to measure sexual anxiety and sexual esteem. Participants rated the items on a Likert scale ranging from 1 (not at all characteristic of me) to 5 (very characteristic of me). Both subscales showed satisfactory internal consistency in previous samples (e.g., \( \alpha = .83 \) and \( .87 \); Snell et al., 1993), as well as in the present sample (\( \alpha = .90 \), sexual anxiety; \( \alpha = .93 \), sexual esteem).

Global Measure of Sexual Satisfaction (GMSEX; Lawrence & Byers, 1995). The French version of the GMSEX (Bois et al., 2013) was used to assess overall sexual satisfaction where participants rated their sexual relationships on five seven-point bipolar scales: bad-good, unpleasant-pleasant, negative-positive, unsatisfying-satisfying, and worthless-valuable. This scale showed high internal consistency in previous studies (e.g., \( \alpha = .96 \); Byers, 2005) and the current study (\( \alpha = .90 \)).

Sexual Compulsivity Scale (SCQ; Kalichman & Rompa, 1995). The French version of the 10-item SCQ (Vaillancourt-Morel et al., 2015) was used to measure sexual compulsivity. Participants answered items related to sexually compulsive behaviour, sexual preoccupations, and sexually intrusive thoughts, on a four-point Likert scale ranging from 1 (not at all like me) to 4 (very much like me). This scale has demonstrated good internal consistency in past studies (e.g., \( \alpha = .86 \); Kalichman & Rompa, 1995) as well as the current study (\( \alpha = .89 \)).

Beck Anxiety Inventory (BAI; Beck et al., 1988). The 21-item French version of the BAI (Freeston et al., 1994) was used to assess the severity of current anxiety symptoms. Respondents rated each item on a four-point Likert scale ranging from 0 (not at all) to 3 (severely, can barely stand it). The BAI presented excellent internal consistency in previous studies (e.g., \( \alpha = .92 \); Beck et al., 1988) and the current sample (\( \alpha = .94 \)).

International Personality Item Pool (Mini-IPIP; Donnellan et al., 2006). The 20-item French Mini-IPIP (Laverdière et al., 2020) was used to measure five personality traits: extraversion, agreeableness, intellect/imagination, conscientiousness, and neuroticism. Participants were asked to specify the accuracy of each phrase on a five-point Likert scale ranging from 1 (very inaccurate) to 5 (very accurate). The subscales have demonstrated acceptable internal consistency in previous studies (e.g., \( \alpha = .70 \) to \( .81 \); Cooper et al., 2010) and the present study (\( \alpha = .70 \) to \( .77 \)).

Analytical Strategy
Missing data for all analyses were handled using Full-Information Maximum Likelihood (FIML) implemented in Mplus (Muthén & Muthén, 2015).

A Confirmatory Factor Analyses (CFA) were performed using Mplus v7.3 (Muthén & Muthén, 2015), on the original three-factor model of the SAS, to evaluate if this structure could be replicated with the French translation in the current sample (objective 1). Models were assessed with several goodness-of-fit
indices (Brown, 2015; Hu & Bentler, 1999; Muthén, 1993): (1) Comparative Fit Index (CFI) to compare the model estimated to a null model (satisfactory values are ≥ .90; Kline, 2005); (2) Tucker–Lewis Index (TLI) to appreciate the fit of the model of interest relative to the null model (optimal values above 0.95; Bentler & Bonett, 1980); (3) Root-Mean-Square Error of Approximation (RMSEA), which assesses the model fit (≤ 0.06 for good, ≤ 0.08 for acceptable; Caron, 2019) with its 90% confidence intervals; and the (4) Bayesian Information Criterion (BIC; Schwarz, 1978), where lower values indicate the optimal model (Nylund et al., 2007). Items were treated as continuous indicators and the maximum likelihood estimator was applied (Muthén & Muthén, 2015).

The development of the brief version of the SAS (objective 2) was done in two steps. Firstly, an exploratory Factor Analysis (EFA) was used on the original SAS to identify latent constructs and select potential items for the SAS-BF; the selection of items was based on: (1) adequate item-total correlations; (2) adequate standardized factor loadings (≥ .50); and (3) the most complete coverage of content breadth as determined by subjective evaluations from the authors (i.e., three experts in clinical psychology, two experts in quantitative sex research, and one expert in scale development; Bötze et al., 2020; Haynes et al., 1995). Secondly, a CFA was performed on the resulting five-factor solution. Due to theoretical similarities and collinearity between two factors in the five-factor solution, CFA was performed to further refine the five-factor solution into a four-factor solution. Fit indices were compared between each solution to select the final model, which best fits the data. Multiple-group analysis (Asparouhov & Muthén, 2014) was also conducted to test the measurement equivalence of the final SAS-BF with women and men separately. To examine invariance across gender, three models were tested: (A) the configural model where no constraints were applied, (B) the loadings model where only the loadings were constrained to equality, and (C) the intercept model with loadings and intercepts constrained to equality across gender. Inference for invariance was based on cut-off thresholds for Δχ², ΔCFI, and ΔRMSEA, where a non-significant p > .05 value for the Δχ² (Putnick & Bornstein, 2016), a ΔCFI < 0.01, and a ΔRMSEA < 0.015 indicate invariance (Chen, 2007; Sass, 2011). Due to convergence issues when testing invariance on the final four-factor model, multiple-group analyses had to be conducted for each factor separately.

Finally, descriptive and inferential data analyses were performed on SPSS v25. To estimate internal consistency, Cronbach’s alphas were calculated for total and subscale scores of the SAS-BF and all validation questionnaires (α ≥ .70 for acceptable, ≥ .80 for good, ≥ .90 for excellent; Nunnally, 1978). Cross-sectional correlations were calculated with sexual satisfaction (GMSEX), sexual esteem (MSQ), sexual compulsivity (SCQ), sexual anxiety (MSQ), anxiety (BAI) and neuroticism (Mini-IPIP). Gender differences in SA levels were also tested using independent samples t-tests on SPSS v25. Due to the lack of imputation methods for missing data on SPSS, some participants did not have enough valid data and t-tests were conducted on a smaller sample of 451 participants. Magnitude of effect sizes for t-tests (Cohen's d: small, from 0.20; medium from 0.50; and large from 0.80) and correlations with convergent and divergent constructs (r: small, from 0.10; medium from 0.30; and large from 0.50; Cohen, 1988) were reported.

RESULTS

Validation of the French version of the original SAS

For the first objective, CFA was conducted to test the original structure of the three-factor SAS. The French version of the original scale displayed poor performance on all fit indices (see Table 1), with CFI < .90, TLI < .90 and RMSEA > .80.

Development of a short-form of the SAS scale

Regarding the second objective, we conducted an EFA which suggested a novel five-factor solution, where Factors 2 (exposure to information) and 3 (sexual communication) remained stable, but Factor 1 (solitary and impersonal sexual expression) appeared subdivided into three distinct constructs: (1) exposure to pornography/erotic content; (2) sexual exploration/masturbation; and (3) displays of affection. This five-factor solution was then tested in CFA and displayed better fit indices than the original SAS (see Table 1), suggesting that a subdivided Factor 1 yields a stronger model, which better represents latent constructs of SA. However, fit indices of the five-factor model were still not optimal (CFI < .90, TLI < .90 and RMSEA = .81). Furthermore, the BIC did not improve between the three and the five-factor models (see Table 1), suggesting the need for further adjustments to the questionnaire structure. Theoretical similarities and collinearity issues (r > .70) were identified through the examination of correlations (Pearson) between the items on the novel displays of affection and pornography/erotic material factors. Thus, these were combined in a four-factor model (20 items) by choosing items from each factor that presented the best loading indices for their respective factors and the smallest correlations with items from other factors. This also took into account conceptual

<table>
<thead>
<tr>
<th>TABLE 1. Factor Structure and CFA Fit Indices for the Three Models</th>
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</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Three-factor*</td>
</tr>
<tr>
<td>Five-factor*</td>
</tr>
<tr>
<td>Four-factor*</td>
</tr>
</tbody>
</table>

Note. Three-factor (Original SAS Structure); Five-factor (Structure based on EFA); Four-factor (Final SAS-BF Structure)
considerations to retain important theoretical aspects of the factor (Böthe et al., 2020).

Upon further examination of the resulting four-factor structure, correlational analyses revealed collinearity issues ($r > .70$) between certain items pertaining to the same subscale: items 10 and 26, items 6 and 35, items 24 and 49, and items 7 and 21. Based on the theoretical similarity of each pair of items (e.g., items 10 "discussing my sexual fantasies with my partner" and 26 "talking with my partner about his/her sexual fantasies"), new items were created by calculating the mean scores of combined items (e.g., "Talking with my partner about our respective sexual fantasies") following Tabachnick and Fidell's (2012) recommendations. Results yielded a final four-factor structure of 16 items. CFA performed on this reduced solution revealed good to excellent model fit to the data (see Table 1), with all factor loading above .50 (see Figure 1). Both fit indices and the BIC improved when compared to the three and five-factor models (see Table 1), suggesting this to be the most adequate model for this sample. The final factors are as follows: (F1) exposure to sex-related information; (F2) sexual communication; (F3) exposure to others' nudity or sexuality; and (F4) sexual exploration. The SAS-BF displayed excellent Cronbach's alpha for total scale ($\alpha = .90$) and acceptable to good Cronbach's alpha for each subscale ($\alpha$ ranged from .79 to .88). The SAS-BF and the original SAS showed strong positive associations with each other, for total score ($r = .95$) and for each respective subscale ($r > .75$), suggesting that the SAS-BF successfully replicates and preserves the original SAS constructs.

The final SAS-BF model was replicated using multiple-group analyses to ensure model invariance across gender (here, men and women; Byrne, 2013). Due to convergence issues when testing invariance on the final four-factor model, we tested each factor independently across gender. Based on Chen (2007) cutoff thresholds, the fit indices (see Table 2) generally suggest noninvariance of the model ($\Delta \chi^2, p < .05; \Delta CFI > .01; \Delta RMSEA > .015$).

Convergent and Discriminant Validity

As expected, higher SAS-BF total scores were significantly associated with reduced sexual satisfaction ($r = -.279; p < .001$), sexual esteem ($r = -.212; p < .001$), and sexual compulsivity ($r = -.155; p < .001$; see Table 3). With regards to similar construct, SAS-BF was positively associated ($r = .198; p < .001$) with the sexual anxiety subscale of the MSQ. SAS-BF total scores were unrelated to general anxiety and neuroticism, suggesting that the level of SA is not a reflection of the severity of anxiety and emotional instability. Factor 2 (Sexual Communication) showed weak but significant correlation with neuroticism ($r = .095, p = .026$). Consistent with the original SAS study (Fallis et al., 2011), intellect/imagination and extraversion personality traits were weakly but significantly associated with lower levels of SA.

Gender Differences

Considering potential gender differences in terms of SA scores, independent sample $t$-test ($n = 451$) revealed that men and women differed significantly on total SAS-BF score ($t(445) = 2.17, p = .030; d = 0.23$), with women reporting higher SA scores ($M = 562.17; SD = 281.65$) than men ($M = 497.68; SD = 286.97$; Table 4). Further examination showed a significant gender differences on the Factor 3 (Exposure to others' nudity or sexual- ity) ($t(442) = 5.33, p < .001; d = 0.56$, where women exhibited higher scores ($M = 162.27; SD = 86.85$) than men ($M = 113.52; SD = 86.17$). However, certain limitations to these results in light of the gender invariance analyses are discussed below.

Sex differences were also observed between general anxiety ($t(485.177) = 4.81, p < .0001, d = .42$) and sexual compulsivity ($t(386.286) = -6.75, p < .0001, d = .61$), with women experiencing higher levels of anxiety ($M = 17.08; SD = 13.20$) than men ($M = 12.13; SD = 10.21$), while men reported higher scores of sexual compulsivity ($M = 18.82; SD = 6.17$) than women ($M = 15.13; SD = 5.85$).

DISCUSSION

Despite sexual and relational difficulties being associated with SA, no brief scale existed in the literature that could reliably and validly assess the severity of SA in multiple socio-sexual contexts. Following previous guidelines and studies for developing brief measures (Böthe et al., 2020; Egitto et al., 2018; Haynes et al., 1995), this study examined the construct validity of the French translation and brief version of the SAS (SAS-BF).

The 16-item SAS-BF is a substantially briefer version of the SAS that has demonstrated satisfactory psychometric qualities comparable to the original 56-item scale (Fallis et al., 2011), while also displaying more conceptually distinctive factors. CFA has shown that the French version of the original three-factor model proposed by Fallis et al. (2011) did not present adequate fit indices. Collinearity and redundancy between items were examined, while EFAs and CFAs were carried out to determine the most adequate factor structure. Results yielded a balanced four-factor model with 4 items per factor, where factors were named after the original SAS proposition: (1) exposure to sex-related information; (2) sexual communication; (3) exposure to others' nudity or sexuality; and (4) sexual exploration. This model showed a strong, positive association with the original SAS, further demonstrating the appropriateness of the scale. Similarly to the original SAS, the SAS-BF showed excellent internal consistency for each of its factors. Furthermore, the diminution of the Cronbach's alpha from .96 (for the original SAS) to .90 (for the SAS-BF) may suggest the brief form succeeded in removing repetitive items, since alphas that are too high (>.90) tend to indicate redundancy (Tavakol & Dennick, 2011). Compared to other classic short measures of SA (e.g., Fisher et al., 1988; Snell et al., 1993), the SAS-BF screens SA manifestations in specific sexual contexts while remaining inclusive of diverse socio-sexual aspects of human sexuality. Moreover, some items of the original (Fisher et al., 1988) and the recently adjusted (Rye & Fisher, 2020) Sexual Opinion Survey, the measure of erotophilia/erotophobia from which the SAS was derived, tend to overlap with other constructs more or less related to SA (e.g., homonegativity), as supported by its association with attitudes toward lesbians and gay men and religious fundamentalism (Rye et al., 2019). In
FIGURE 1. Confirmatory Factor Analysis of the final four-factor model, SAS-BF (16 items) for the total sample. Values and weights of the standard regression per item in the SAS-BF; ESI: Exposure to Sex-related Information, SC: Sexual Communication, ENS: Exposure to others' Nudity or Sexuality, SE: Sexual Exploration.
TABLE 2. Goodness of Fit Indexes in Testing in Variance of Factor Loadings, Intercepts and Residuals across Genders

<table>
<thead>
<tr>
<th>Factors</th>
<th>Test level</th>
<th>Δχ²</th>
<th>p</th>
<th>ΔCFI</th>
<th>ΔRMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1 (ESI)</td>
<td>Configural model</td>
<td>134.28</td>
<td>&lt; .00001</td>
<td>-0.124</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>Loadings model</td>
<td>-102.89</td>
<td>&lt; .00001</td>
<td>0.102</td>
<td>-0.169</td>
</tr>
<tr>
<td></td>
<td>Intercept model</td>
<td>14.71</td>
<td>.002</td>
<td>-0.011</td>
<td>-0.029</td>
</tr>
<tr>
<td>Factor 2 (SC)</td>
<td>Configural model</td>
<td>107.59</td>
<td>&lt; .00001</td>
<td>-0.095</td>
<td>0.154</td>
</tr>
<tr>
<td></td>
<td>Loadings model</td>
<td>14.71</td>
<td>.002</td>
<td>-0.011</td>
<td>-0.029</td>
</tr>
<tr>
<td></td>
<td>Intercept model</td>
<td>14.71</td>
<td>.002</td>
<td>-0.011</td>
<td>-0.029</td>
</tr>
<tr>
<td>Factor 3 (ENS)</td>
<td>Configural model</td>
<td>91.99</td>
<td>&lt; .00001</td>
<td>-0.014</td>
<td>0.062</td>
</tr>
<tr>
<td></td>
<td>Loadings model</td>
<td>-60.64</td>
<td>&lt; .00001</td>
<td>0.101</td>
<td>-0.105</td>
</tr>
<tr>
<td></td>
<td>Intercept model</td>
<td>91.99</td>
<td>&lt; .00001</td>
<td>-0.014</td>
<td>0.062</td>
</tr>
<tr>
<td>Factor 4 (SE)</td>
<td>Configural model</td>
<td>184.96</td>
<td>&lt; .00001</td>
<td>-0.171</td>
<td>0.205</td>
</tr>
<tr>
<td></td>
<td>Loadings model</td>
<td>-154.58</td>
<td>&lt; .00001</td>
<td>0.149</td>
<td>-0.204</td>
</tr>
<tr>
<td></td>
<td>Intercept model</td>
<td>184.96</td>
<td>&lt; .00001</td>
<td>-0.171</td>
<td>0.205</td>
</tr>
</tbody>
</table>

TABLE 3. Associations between SAS-BF and Correlates for Construct and Discriminant Validity

<table>
<thead>
<tr>
<th>Validation constructs</th>
<th>M (SD)</th>
<th>α</th>
<th>Total SAS-BF</th>
<th>Factor 1 (ESI)</th>
<th>Factor 2 (SC)</th>
<th>Factor 3 (ENS)</th>
<th>Factor 4 (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual esteem</td>
<td>10.81 (5.32)</td>
<td>.90</td>
<td>-212**</td>
<td>-021</td>
<td>-288**</td>
<td>-161**</td>
<td>-156**</td>
</tr>
<tr>
<td>Sexual compulsivity</td>
<td>16.57 (6.20)</td>
<td>.89</td>
<td>-155**</td>
<td>.028</td>
<td>-101*</td>
<td>-234**</td>
<td>-127**</td>
</tr>
<tr>
<td>Sexual anxiety (MSQ)</td>
<td>6.11 (5.61)</td>
<td>.93</td>
<td>198**</td>
<td>.009</td>
<td>280**</td>
<td>141**</td>
<td>153**</td>
</tr>
<tr>
<td>Anxiety</td>
<td>15.41 (12.32)</td>
<td>.94</td>
<td>068</td>
<td>051</td>
<td>064</td>
<td>059</td>
<td>067</td>
</tr>
<tr>
<td>Personality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>13.24 (3.47)</td>
<td>.75</td>
<td>-94*</td>
<td>-.039</td>
<td>-127**</td>
<td>-054</td>
<td>-011</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>16.36 (2.86)</td>
<td>.75</td>
<td>-046</td>
<td>-.047</td>
<td>-108*</td>
<td>-057</td>
<td>-035</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>13.45 (3.33)</td>
<td>.73</td>
<td>041</td>
<td>.082</td>
<td>-068</td>
<td>067</td>
<td>038</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>11.75 (3.57)</td>
<td>.77</td>
<td>074</td>
<td>034</td>
<td>.95*</td>
<td>077</td>
<td>036</td>
</tr>
<tr>
<td>Intellect/imagination</td>
<td>15.38 (3.04)</td>
<td>.70</td>
<td>-126**</td>
<td>-147**</td>
<td>-103*</td>
<td>-023</td>
<td>-055</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01.

TABLE 4. Means and Standard Deviations of the SAS-BF Total Score and Subscales and Gender Comparison

<table>
<thead>
<tr>
<th></th>
<th>Female (n = 323)</th>
<th>Male (n = 128)</th>
<th>Total (n = 451)</th>
<th>t (df)</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to Information</td>
<td>171.72 (102.63)</td>
<td>174.88 (98.47)</td>
<td>170.39 (101.63)</td>
<td>-29</td>
<td>.77</td>
<td>.04</td>
</tr>
<tr>
<td>Sexual Communication</td>
<td>126.83 (97.67)</td>
<td>115.32 (94.83)</td>
<td>122.00 (94.93)</td>
<td>1.12</td>
<td>.26</td>
<td>.12</td>
</tr>
<tr>
<td>Exposure to others' nudity or sexuality</td>
<td>162.27 (86.85)</td>
<td>113.52 (86.17)</td>
<td>144.79 (88.24)</td>
<td>5.33</td>
<td>.001**</td>
<td>.56</td>
</tr>
<tr>
<td>Sexual Exploration</td>
<td>109.46 (104.38)</td>
<td>108.24 (87.99)</td>
<td>106.29 (98.67)</td>
<td>.15</td>
<td>.88</td>
<td>.01</td>
</tr>
<tr>
<td>Total Score</td>
<td>562.17 (281.65)</td>
<td>497.68 (286.97)</td>
<td>534.11 (281.12)</td>
<td>2.17</td>
<td>.03*</td>
<td>.23</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01
comparison, the SAS-BF measures individuals’ comfort with sexuality in a nuanced and an inclusive manner in terms of contexts (i.e., sexual communication, solitary and dyadic sexual interaction, sexual information, sexual fantasies), without restricting its reference to heteronormative sexual behaviours or stimuli.

Not only was the construct validity of the SAS-BF supported, but its convergent validity was also established through its associations with sexual satisfaction, sexual esteem, sexual compulsivity and anxious response to sexual interactions. In line with previous studies, SA had moderate negative associations with sexual satisfaction (Bigras et al., 2017; Brassard et al., 2015; Nelson & Purdon, 2011), weak-to-medium association with sexual esteem (Brassard et al., 2015; Snell et al., 1993), and weak negative association with sexual compulsivity (Efrati & Mikulincer, 2018), supporting the validity of this brief scale. It is worth noting that sexual communication (Factor 2) showed the strongest correlation with validation constructs (e.g., sexual satisfaction, sexual esteem), consistently with literature suggesting that being able to openly express sexual preference and pleasure during sex without apprehension (i.e., sexual assertiveness; Snell et al., 1993) is associated with both sexual satisfaction and sexual self-esteem (Babin, 2013; Brassard et al., 2015; Byers, 2011; Frederick et al., 2017; Oates & Offman, 2007; Rehman et al., 2019). Regarding the absence of significant associations between SA and general anxiety (BAI), this result is consistent with previous findings (Fallis et al., 2011), and might be explained by the cross-sectional nature of our study and the fact that the BAI measures current experience of anxiety symptoms. A plausible explanation is that, as individuals reporting increased level of SA may have developed over time strategies to avoid sexual contexts eliciting anxious response in their every-day life, a cross-sectional perspective may not detect relationship between current level of SA and anxiety symptoms. Finally, our results do not suggest that SA is a manifestation of a latent anxiety syndrome, which requires further research exploring potential relationships between SA and anxiety traits.

As documented in previous studies (Bigras et al., 2017; Fallis et al., 2011; Kedde, 2012; Nelson & Purdon, 2011; Rye et al., 2015), our analyses suggest gender differences in SA measured with the SAS-BF, where women exhibit higher levels of SA than men. Furthermore, our results add to the literature by showing gender differences regarding sexual compulsivity and anxiety symptoms; these findings are congruent with previous evidence showing that men tend to express more sexual compulsivity than women (Bothe et al., 2018; Walton et al., 2016), as the latter tend to show higher levels of anxiety than men (Asher et al., 2017; McLean et al., 2011).

Consequently, the possibility of using the SAS-BF in French-speaking contexts is a relevant contribution to research and clinical settings, suggesting that this new scale allows for the quick assessment of sexual anxiety traits and its correlates in large samples.

Limitations and Future Studies

The present work had some limitations that should be highlighted. The sample was not representative of the general population (e.g., predominantly women) and limited to the French-Canadian population, restricting the generalizability of the findings. Although we analyzed gender differences, the implications of the results must be made with caution considering results from multiple-group analyses for gender invariance. Consequently, t-test results suggesting gender differences therefore require further confirmation. Future studies, in larger samples, are needed to examine model invariance of the SAS-BF and further explore the significance behind possible gender differences. Furthermore, both CFA and EFA were conducted on the same sample. While this allows to propose a brief-form for the SAS based on model comparison, this short-form remains exploratory and further replications with other samples are mandatory to validate its structure (Boateng et al., 2018). Similarly, future studies are needed to further examine the construct and clinical validity of the SAS-BF in different sociodemographic groups and (sub)cultural contexts. Moreover, this study used cross-sectional, self-reported data on self-selected sample; thus, the results may be prone to biases such as social desirability. Furthermore, studies need to be conducted on individuals with SA, in order to access this instruments’ ability to discriminate between individuals with clinical levels of SA and individuals with typical functioning. This would allow for the establishment of the SAS-BF as a diagnostic tool for the assessment of SA. In future studies, the SAS-BF may be applied in diverse nationally representative studies to gain better knowledge on the prevalence of problematic SA. Longitudinal studies would be fruitful to investigate the temporal stability of the SAS-BF and to examine the natural course of problematic SA.

Conclusion

The 16-item SAS-BF is a brief, valid, and reliable measure of SA in the general French-Canadian population, suggesting its relevance in experimental and clinical settings, as well as large-scale community studies. This measure may facilitate further research on SA, sexual functioning and wellbeing. Future research is encouraged to extend the validity testing of the SAS-BF, test measurement equivalence between gender and age groups, and assess individual differences related to sociodemographic factors. Moreover, studies with clinical samples will allow for the assessment of an optimal cut-off reflecting severe and disruptive anxiety in sexual contexts.

REFERENCES


APPENDIX A
French version of the SAS-BF with original English version items and numbers.

Échelle d'Anxiété sexuelle—Forme Brève

Ci-dessous se trouve une série de situations qui peuvent provoquer chaque de l'anxiété ou de l'inconfort à un degré plus ou moins élevé. Merci d'évaluer le niveau de confort que vous ressentiriez dans chacune des situations suivantes :

Degré d'inconfort ou d'anxiété (Inscrivez le pourcentage dans la colonne “I”)

<table>
<thead>
<tr>
<th>Extrémement</th>
<th>Neutre</th>
<th>Extrémement Inconfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaisant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>60</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>90</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

1. Être exposé·e à de l'information sur les infections transmises sexuellement [14: Being exposed to information about sexually transmitted infections]
2. Discuter avec mes amis de questions générales de nature sexuelle, comme les menstruations, la grossesse ou l'accouchement [27: Talking with my friends about general matters of a sexual nature, such as menstruation, pregnancy, childbirth]
3. Entendre parler de maladies qui affectent les organes génitaux, tel que le cancer du col de l'utérus, des testicules, de la prostate ou du sein [44: Being exposed to information about diseases of the sex organs, such as cervical cancer, testicular cancer, prostate cancer, breast cancer]
4. Être exposé·e à de l'information sur les moyens de contraception et leur utilisation [55: Being exposed to information about contraceptives and contraceptive use]
5. Accepter d'essayer des pratiques sexuelles ou des positions que je trouve inhabituelles mais que mon·ma partenaire suggère [20: Agreeing to try sexual activities or positions that I find unusual but my partner suggests]
6. Discuter avec mon·ma partenaire de nos fantasmes sexuels avec mon·ma partenaire [26: Talking with my partner about our respective sexual fantasies]
7. Suggérer de nouvelles pratiques sexuelles ou positions à mon·ma partenaire [34: Suggesting new sexual activities or positions to my partner]
8. Dire à mon·ma partenaire ce qui me plaît et me déploît sexuellement [50: Telling my partner what pleases me and does not please me sexually]
9. Voir deux personnes en train de s'embrasser ou de se caresser érotiquement [2: Seeing two people kissing or fondling together]
10. Regarder une scène d'un film de box-office où les acteurs sont nus [3: Watching a movie scene from a major box office movie in which people were naked]
11. Naviguer sur des sites Internet ou regarder des magazines qui présentent des photos ou des vidéos montrant explicitement des organes génitaux et de la pénétration (pornographie) [35: Visiting Internet sites or reading magazines that feature sexually explicit photos or video clips showing genitals or penetration (pornography)]
12. Visiter des sites Internet ou regarder des magazines qui montrent des photos ou des vidéos érotiques (p.ex., nudité) [49: Visiting Internet sites or reading magazines that feature erotic photos or videos (e.g., nudity)]
13. Me masturber [5: Masturbating]
14. Utiliser des jouets sexuels, par exemple un vibrateur, quand je suis seul·e ou avec mon·ma partenaire [21: Using sex toys, such as a vibrator, when I am alone or with my partner]
15. Explorer les zones érogènes ou sexuellement excitables de mon corps lorsque je suis seul·e [32: Exploring erogenous, or sexually exciting, parts of my body when I am alone]
16. Fantasmer sur des pensées sexuelles excitantes lorsque je me masturbe pour ressentir plus d'excitation sexuelle [53: Fantasizing about arousing sexual thoughts during masturbation in order to enhance my sexual excitement]