

## Psychometric Properties of the Persian Version of Social Anxiety Scale for Social Media Users (SAS-SMU)

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### Abstract

**Objective:** Social anxiety refers to an excessive concern or fear about social situations. It seems that social media, which has become one of the most popular and effective tools for communication today, can be one of the contexts of social anxiety. Due to the lack of a Persian instrument to assess social anxiety in the context of social networks, the current study was undertaken to analyze the psychometric criteria of the Iranian version of the Social Anxiety Scale for Social Media Users (SAS-SMU). The SAS-SMU is a 21-item questionnaire designed by Alkis and colleagues (2017) to measure social anxiety emerging from the social media platforms.

**Method:** In this study, a total of 842 participants within the age range of 11 to 82 years old (mean age  $33.11 \pm 12.134$ ), 59% female) answered the questions in an online survey. The original version of the scale was translated into Persian using the back translation procedure. All participants completed a Demographic Questionnaire, the SAS-SMU, and the Beck Anxiety Inventory. In order to analyze the collected data, internal and external consistency, factor analysis, construct validity, and confirmatory factor analysis (CFA) were examined. A significance level of less than 0.05 was considered to determine statistical significance.

**Results:** Four subscales were obtained from the exploratory factor analysis (SCA, PCA, IA, and SEA), which were confirmed by the confirmatory factor analysis. Cronbach's alpha for internal consistency was found to be 0.931 for the total scale and 0.920, 0.846, 0.901, 0.828 for SCA, PCA, IA, and SEA, respectively. In addition, the test-retest scores of 30 participants (interval: between 2 to 3 weeks) for all four subscales (SCA = 0.641, PCA = 0.773, IA = 0.688, SEA = 0.727) indicated acceptable stability of the questionnaire over time.

**Conclusion:** This study validates the Persian version of the SAS-SMU for use in studies in the field of psychological problems related to social media and online communications.

**Key words:** *Social Anxiety; Social Media; Social Networking; Validation Study*

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### Article Information:

Received Date: 2021/10/09, Revised Date: 2022/01/12, Accepted Date: 2022/12/18



Anxiety is described as a future-oriented mood that is associated with worry, readiness for possible unpleasant events, and physical symptoms such as increased heart rate, muscle tension, and irritability or restlessness (1-3). Social anxiety disorder (SAD) is known as one of the most common anxiety disorders, characterized by a noticeable unease about social conditions where there is the possibility of being subjected to scrutiny and evaluation by others; examples of such conditions include being involved in a conversation or meeting strangers, being watched while eating or drinking, and giving a speech in front of an audience (1). Social phobia, formerly known as social anxiety, was recognized by the DSM-III since 1980 and has been used in research literature (4). In fact, one study described it as "neglected anxiety disorder" (5). Despite this neglect, some studies have been done on some of the characteristics of individuals such as embarrassability, heterosocial anxiety, dating anxiety, love shyness, and etc. by social psychologists. Rapee (1995) describes social anxiety as a continuum that includes different levels: lack of social anxiety, normal levels of social anxiety, shyness, social fears and avoidance behaviors (specific social anxiety), generalized social anxiety disorder, and finally avoidant personality disorder (4).

Excessive worry about future dangers, alertness, and avoidance behaviors are common symptoms of anxiety disorders, which are the most common mental disorders (1). Numerous studies have confirmed the high prevalence of anxiety disorders among different countries in recent years (6-9). For example, the 12-month prevalence of anxiety disorders is 10% among the US population (10). Similarly, based on a new study in Iran, the 12-month prevalence of anxiety disorders in 7886 participants (aged 15 to 64 years) was reported to be 15.6% (11). Social anxiety is the most prevalent disorder among anxiety disorders after specific phobia (1), and there is substantial evidence confirming its high prevalence in different societies in recent years (12-17).

It is worth mentioning that in a study comparing shy students with those who had a clinical diagnosis of social phobia, no major differences were reported in the physiological, cognitive, and behavioral characteristics of the two groups (18). Social anxiety can have deleterious effects on personal relationships, daily activities, career and academic achievement (19). Recent studies have shown a significant association between SAD and some psychological constructs such as perfectionism and neuroticism (20), depression, substance and alcohol use (21), as well as anger, distrust of others, and problems with body image issues (19, 22).

With the rapid advancement of technology, social networking has become an essential part of everyday activity. Chegeni *et al.* (2022) stated that 88.5% of the participants of their research in Iran use social media and their most common motivation for using social media platforms is communication with others. The amount of

time spent on social media in the mentioned study was reported as  $4.0 \pm 3.9$  hours per day (23). Hence, the correlation between some psychological problems and the use of social networks has been studied by several researchers in recent years (24-32). By definition, social networking platforms, despite their different features and capabilities, share several main and common elements that are as follows: 1) users are both the creators and the consumers of content; 2) users can share their content or react to the content of others; 3) users' personal information is necessary for accessing content; and 4) users can create networks of friends and followers on these platforms (33). WhatsApp, Instagram, Facebook, Twitter, and Telegram are examples of popular social networks. There is ample evidence to support a significant correlation between problematic social media use and social anxiety (e.g. (34-37)). For example, Zsido *et al.* (2020) showed that social anxiety due to the fear of negative evaluation from others can lead to the problematic use of the Internet and social networks. Similarly, another study found that social anxiety predicts problematic Internet and social media use (35). Apaolaza *et al.* (2019) also indicated that mindfulness reduces the problematic use of social media by increasing self-esteem and reducing social anxiety. Picho-Prelorentzos *et al.* (2020) emphasized the role of cognitive structures in ambiguous and vulnerable situations such as online dating in their study. They demonstrated that negative self-evaluation and low self-efficacy predict social anxiety in online dating. According to Green *et al.* (2016), people with social anxiety feel more comfortable and have more control over their online conversations compared to face-to-face interactions. Additionally, the findings of Wolniewicz *et al.* (2018) revealed a significant correlation between the fear of negative evaluation and excessive use of social media for communication and social interaction among university students (38). These findings suggest that communication through social media as indirect/online interactions seem to be usually preferred as a means to alleviate the experience of rejection, anxiety, evaluation, and stress in face-to-face interactions (32). Such a view is not so unexpected because based on the results of Chegeni *et al.*'s study (23), the use of social media is more prevalent in adolescents than in adults. On the other hand, in the national study of the prevalence of social anxiety that Mohammadi *et al.* (2020) conducted on children and adolescents (39), the prevalence of social anxiety was reported as 1.8%. According to that study, social anxiety is more prevalent in adolescents aged 15 to 18 than in children. This finding, in addition to that a significant percentage of social media users are adolescents, maybe can explain to some extent the relationship between social anxiety and the amount of social media use.

It is clear that the correlation between social anxiety and excessive use of social networks needs to be studied more comprehensively. It is also worth noting that measuring individuals' social anxiety in online interactions can serve

as a useful tool to facilitate extensive research in this area. So far, various scales have been designed to measure social anxiety in different situations (5, 40, 41). For example, a number of social anxiety scales with different dimensions have been standardized by Iranian researchers, such as the Social Phobia Inventory (42), the Persian Version of Social Anxiety Questionnaire for Adults (43), the Persian Version of Social Phobia Scale (44), the Brief Fear of Negative Evaluation Scale (45), the Farsi version of Social Interaction Anxiety Scale (46). Nonetheless, despite the undeniable prevalence of social media use and its importance in interpersonal relationships (47-50), there had been no scale to specifically measure social anxiety in the context of social media. In this regard, for the first time, Alkis *et al.* (2017) designed the Turkish edition of the Social Anxiety Scale for social media users (SAS-SMU) and then developed the English version with good psychometric properties (51). The questionnaire has been used in several studies so far (52-54). In addition, the Swedish version (55) and the Chinese version (56) have been statistically evaluated and introduced with desirable psychometric properties. The present study was performed to provide the Persian version of the SAS-SMU and to examine its psychometric properties such as exploratory and confirmatory factor analyses, internal consistency, convergent validity, and test-retest reliability for use in the Persian language population. The questionnaire will be able to play a key role in conducting future research on psychological problems associated with social networks interactions.

## Materials and Methods

### Sample

According to the nature of the study, the target population was all Persian-speaking users of social networks. Therefore, social media users (WhatsApp, Instagram, Twitter and Telegram) were purposefully selected as the sample. The link to the SAS-SMU online survey was distributed via various groups of social networks (e.g., Instagram, WhatsApp, Telegram and Twitter) and the completed forms were received from a total of 842 persons (495 females and 347 males). The method of sampling was convenience sampling to select social media users. In the present study, those participants were selected whose minimum duration of social media use was three hours per day, and this amount of use was not related to their job or profession. Of these, 242 participants answered the Beck Anxiety Inventory in addition to the SAS-SMU (answering all questions was mandatory). The pencil-paper form of the SAS-SMU was also completed by 30 people (14 males and 16 females) to examine test-retest reliability (test-retest interval: between two to three weeks).

### Procedure and Measure

#### Demographic information

The study participants answered questions related to demographic information including age, gender, and their

level of education (under diploma to doctorate) in addition to the SAS-SMU questions. They were also asked to specify their frequency and average duration of social network usage (very low = 1 to very high = 5).

#### Social Anxiety Scale for Social Media Use (SAS-SMU)

The SAS-SMU was provided by Alkis *et al.* (2017) with 21 questions and 4 dimensions (shared content anxiety (SCA), privacy concern anxiety (PCA), interaction anxiety (IA), and self-evaluation anxiety (SEA)). The authors confirmed the questionnaire as an appropriate instrument to assess social anxiety in public network, with the Cronbach's alpha coefficients of 0.92 for the SCA subscale (7 items), 0.84 for the PCA subscale (5 items), 0.88 for the IA subscale (6 items), and 0.80 for the SEA subscale (3 items). In addition, according to the authors' reports, the correlations scored higher than 0.60 for the questions of each dimension, confirming the consistency of the items for all four subscales. Further, the four-dimension model demonstrated good fit with all fit indices (CFI = 0.95, TLI = 0.95, NFI = 0.93, RMSEA = 0.05). In order to prepare the Iranian version of the questionnaire, after obtaining the consent of the original author via email, the questions were translated from English into Persian by the authors and then back-translated into English by another native speaker. After comparing the two texts and making necessary corrections, the final Persian version of 21 questions with a 5-point Likert scale ("never" = 1 to "always" = 5) was provided for participants to respond online.

#### Translation of the Scale

The translation process had multiple steps. Initially, the researchers translated each question of the English edition of the questionnaire into Persian. Secondly, two Persian/English bilingual instructors scrutinized all the translated questions in detail with regard to exactness, sense, choice of words, dictation, and sentence structure. As a consequence of the comments and suggestions received, any required modifications were made to unsatisfactory items with the help of an independent bilingual person. Thirdly, five proficient and experienced experts in the area of social media studies, fluent in both English and Persian, examined each sentence to make sure that the perfect meaning was attained in translating each item from English to Persian. The phrasing of seven questions were afterward edited so as to achieve the most appropriate meaning, in accordance with the experts' recommendations.

#### Beck Anxiety Inventory

The Beck Anxiety Inventory was developed by Beck *et al.* (57) consisting of 21 questions. Each item of this questionnaire is rated on a 4-point Likert scale from 0 (not at all) to 3 (nearly every day), and its Cronbach's alpha and test-retest reliability coefficients are 0.93 and 0.83, respectively, for a two-week interval. The Iranian version of the BAI with the Cronbach's alpha coefficient of 0.92, split-half reliability coefficient of 0.91, and test-retest reliability coefficient (one week) of 0.81 was provided by Fata and colleagues (58). The Beck Anxiety Inventory

was used to measure convergent validity in the present study.

**Data analysis**

For data analysis, a number of statistical methods were employed. Firstly, Exploratory Factor Analysis (EFA) was conducted by cross-validation for half of the sample (421) using Principal Component Analysis (PCA) with Oblimin rotation. Direct Oblimin Rotation was used according to previous studies (59, 60). The following three criteria were used to extract the factors: One Eigenvalue criterion based on Kairs and Guttman (61, 62), parallel analysis and Velicer's MAP test based on Hayton (63, 64), as well as the scree test proposed by Cattell (65). Secondly, Confirmatory Factor Analysis (CFA) was performed on the other half of the sample to cross-validate the analysis. The good fit indices examined in this study are Chi-Square, Chi-Square/df, Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), Adjusted Goodness of Fit Index (AGFI), Incremental Fit Index (IFI), Relative Fit Index (RFI) and Standardized Root Mean Square Residual (SRMR). Thirdly, the internal consistency reliability coefficient for all the subscales was calculated using Cronbach's alpha and Composite Reliability coefficients. Fourthly, the stability of the questionnaire was assessed by a test-retest reliability analysis (interval: between two to three weeks). Fifthly, Intraclass Correlation Coefficient (ICC) was conducted to determine inter-rater reliability. Finally, Pearson correlation analyses were conducted to assess the convergent validity between the SAS-SMU and Beck

Anxiety Inventory. The SPSS-23 software was employed to calculate Exploratory Factor Analysis (EFA), internal consistency, and stability of the questionnaire. The LISREL-8.70 software was also used to conduct confirmatory factor analysis.

**Results**

**Descriptive Statistic**

Out of 842 participants in the age range of 11 to 82 years, the mean age was  $33.11 \pm 12.134$ . Mean, standard deviation, maximum and minimum, skewness, and kurtosis of scores obtained from the data collected are given in Table 1. Since the sample size is larger than 300, Kolmogorov-Smirnov and Shapiro-Wilk tests may be unreliable. Skewness and kurtosis were analyzed with descriptive statistics. The acceptable range is from -3 to +3 and from -10 to +10 for skewness and kurtosis, respectively, when developing SEM (66). In the present study, both skewness and kurtosis are less than the absolute value of 1. Therefore, the results indicate that the data distribution is normal.

In the present study, 495 (59%) of the participants were females and 347 (41%) were males. Approximately 75% of participants were under 40 years of age. The distribution of education among the subjects was as follows: 69 (8%) of the subjects had less than a diploma, 202 (24%) had a diploma, 341 (41%) had a bachelor's degree, 171 (20%) had a master's degree, and 59 (7%) had a doctorate. Additionally, the average time spent by the subjects on social media was four hours.

**Table 1. Descriptive Statistics of the Scores of Social Anxiety Scale for Social Media Users**

	Mean	SD	Min	Max	Skewness	Kurtosis
Total score	53.07	16.7	21	105	0.544	-0.073
SCA	16.1	6.9	7	35	0.7	-0.33
PCA	17.10	5.23	5	25	-0.33	-0.67
IA	12.8	5.73	6	30	0.93	0.37
SEA	7.1	3.2	3	15	0.63	-0.4

Notes: SD = Standard Division; SCA = Shared Content Anxiety; PCA = Privacy Concern Anxiety; IA = Interaction Anxiety; SEA = Self-Evaluation Anxiety

**Exploratory Factor Analysis**

The results of Exploratory Factor Analysis of the Persian version of the SAS-SMU are shown in Table 2. The principal component analyses were performed for extracting factors, by which 4 factors were obtained and this is exactly consistent with the original version of the SAS-SMU (51). Furthermore, the number of factors by parallel analysis and Velicer's MAP test is equal to four factors. These four factors together account for about 72% of the common variance, which is an acceptable value given that the expected variance in social science studies is 60% (67, 68). It should be noted that out of 72% of the total variance of the model, 34% is explained by the first

factor (SCA). The variances explained by factors 2, 3, and 4 are 21%, 9%, and 7%, respectively. Table 2 shows the relationship between factors and variables (questions). All values in this table are above 0.40 and this indicates a strong relationship between the questions and the relevant factor (69). In addition, the Kaiser-Meyer-Olkin test result was 0.935 (above 0.60) and the Bartlett test result ( $\chi^2 = 11453.009$ ;  $df = 210$ ;  $P < 0.001$ ) was satisfactory. The scree diagram (Figure 1) also shows the 4 mentioned factors with eigenvalues greater than one.

**Table 2. Exploratory Factor Analysis with Principal Component Analysis of Social Anxiety Scale for Social Media Users (Oblimin Rotation Transformation Including Factors with Eigenvalue of 1 or More)**

Questions	Factor1 (SCA)	Factor2 (PCA)	Factor3 (IA)	Factor4 (SEA)
1) I feel anxious about the fact that others might find my actions awkward.	0.582	0.051	0.134	0.075
2) I am concerned about being ridiculed by others for the content I have shared.	0.833	0.001	0.030	0.057
3) I am concerned about the fact that the content I share will not be liked by others.	0.854	0.040	0.009	0.040
4) I am afraid that my close friends will not approve of my behavior.	0.859	0.017	0.002	0.004
5) I would feel uncomfortable when my friends publicly express their dislike about content I have shared.	0.839	0.075	0.106	0.014
6) I am concerned about disapproval of my behaviors by others.	0.850	0.002	0.003	0.073
7) I am concerned about being judged about my shared content by my friends in the presence of others.	0.808	0.026	0.033	0.031
8) The possibility of having my private information acquired by others makes me feel anxious.	0.147	0.738	0.041	0.104
9) The possibility of having my private information shared publicly makes me anxious.	0.081	0.816	0.052	0.127
10) I feel uneasy when my friends share my private information with people I do not know.	0.031	0.813	0.071	0.032
11) I would be concerned if my personal space is accessed without my consent.	0.074	0.816	0.051	0.039
12) I feel anxious about how social media companies/executives handle privacy policy regarding my private life.	0.094	0.657	0.099	0.148
13) I feel anxious when talking with people I have just met.	0.055	0.032	0.855	0.084
14) I feel nervous when I talk with people I do not know very well.	0.047	0.042	0.843	0.067
15) I feel uneasy while making new friends.	0.060	0.020	0.836	0.127
16) I feel tense when I meet someone for the first time.	0.041	0.018	0.830	0.097
17) I am afraid of interacting with others.	0.019	0.016	0.777	0.095
18) I feel nervous when I have to talk with others about myself.	0.038	0.057	0.632	0.092
19) I feel anxious about making a negative impression on people.	0.072	0.097	0.098	0.518
20) I am concerned about people thinking poorly of me.	0.147	0.002	0.061	0.504
21) I feel anxious about not being able to meet people's expectations.	0.101	0.008	0.062	0.505
Eigenvalues	33.729	21.433	9.149	6.919
Explained variance (%)	33.729	55.162	65.311	72.23

Note. Loadings with absolute values of 0.40 or more are shown in bold; SCA = Shared Content Anxiety; PCA = Privacy Concern Anxiety; IA = Interaction Anxiety; SEA = Self-Evaluation Anxiety

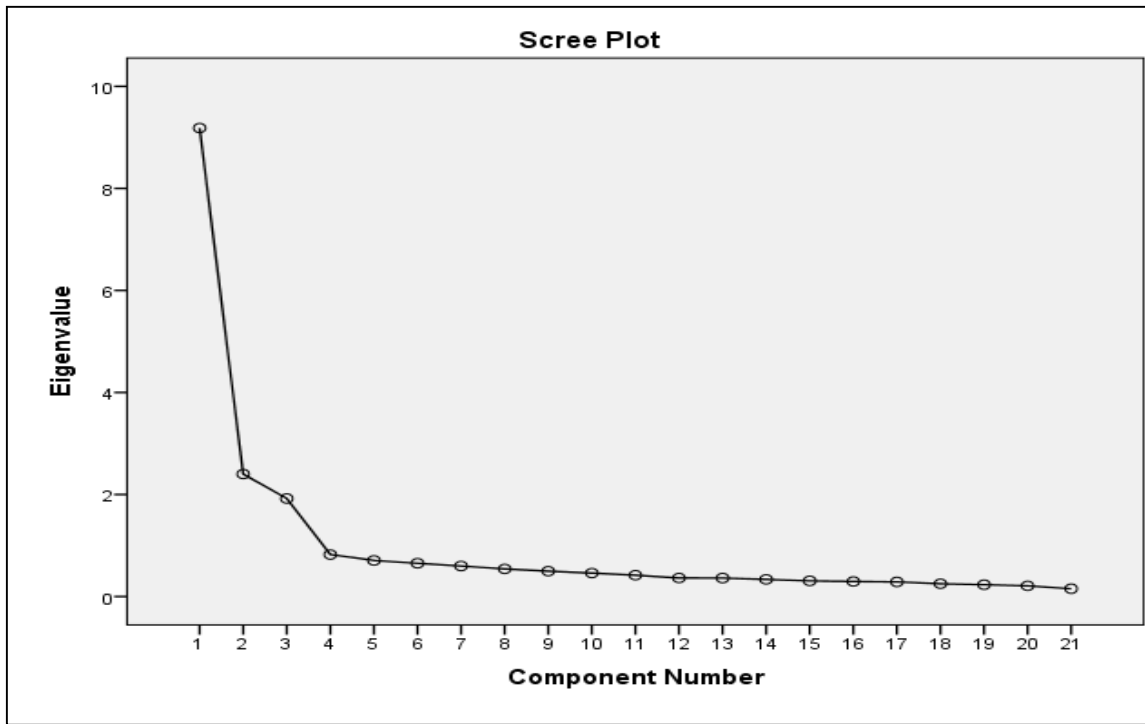


Figure 1. Scree Plot of the Principal Component Analysis of Social Anxiety Scale for Media Users

**Confirmatory Factor Analysis**

For the purpose of evaluating the conceptual model of the original version of the questionnaire, Confirmatory Factor Analysis was employed by using the LISREL-8.50 software. Confirmatory Factor Analysis was performed on the other half (421) of the sample to cross-validate the analysis. The estimation method in confirmatory factor analysis was the maximum likelihood (ML). The assumption of ML is that the observed indicators pursue a continuous and multivariate normal distribution, which is not suitable for observed ordinal variables. As shown in Figure 2, the relationship of all extracted factors with the observed variables (questions) is desirable (standardized factor loading greater than 0.40) (69). Moreover, the fit indices ( $\chi^2 = 626.78$ ;  $df = 181$ ;  $P\text{-value} = < 0.000001$ ;  $RMSEA = 0.054$ ) indicate a reasonable fit of the model. Since values above 0.90 for GFI, AGFI, CFI, IFI, RFI, NNFI, NFI, a value less than 0.080 for SRMR and values between 0.05 and 0.07 for RMSEA are acceptable, the values obtained in the present study (IFI = 0.96; CFI = 0.96; AGFI = 0.92; RFI = 0.94; GFI = 0.94; NNFI and NFI = 0.95; SRMR = 0.047; RMSEA = 0.05; TLI = 0.95) shown in Table 3 indicate a relatively good

fit (70, 71). Further, to evaluate the construct validity of the questions, first-order confirmatory factor analysis was used. Factor-loading questions, R-squared (R<sup>2</sup>), and Average Variance Extracted (AVE) were calculated for each factor (Table 4). The construct validity of all items is approved, according to the value of factor loading (more than 0.40) and also the significance level of less than 0.05 ( $P < 0.05$ ) (all t values are greater than 1.96). The results also indicated that the AVE index is greater than 0.50. The AVE index represents the average variance extracted each factor by its questions. The larger the index, the greater the fit. Fornell and Larcker hold that validity exists when the AVE is greater than 0.50 (72, 73). In order to modify the original model, Error Covariance between two questions, 8 and 9, on the PCA subscale (Decrease in Chi-Square = 87.12) as well as Error Covariance between two other questions, 13 and 14, on the IA subscale (Decrease in Chi-Square = 61.35) were released due to the correlation between the error covariance in these items. By modifying the original model, the RMSEA improved by about 0.01 (decreased from 0.064 to 0.054).

Table 3. Model Fit Indices Calculated Using Confirmatory Factor Analysis

Chi-Square	df	Chi-Square/df	RMSEA	90% CI RMSEA	GFI	CFI	NFI	NNFI	AGFI	IFI	RFI	TLI	SRMR
626.78	181	3.46	0.054	0.49-0.59	0.94	0.96	0.95	0.95	0.92	0.96	0.94	0.95	0.047

Note: RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; CFI = Comparative Fit Index; NFI = Normed Fit Index; NNFI = Non-Normed Fit Index; AGFI = Adjusted Goodness of Fit Index; IFI = Incremental Fit Index; RFI = Relative Fit Index. TLI = Tucker-Lewis index. SRMT = Standardized Root Mean Square Residual.

**Table 4. Factor Loading, T-Value for each Question and Average for each Factor of Social Anxiety Scale for Media Users**

Factors	Un-standardized Factor loading	Standardized Factor loading	T-Value	R <sup>2</sup>	AVE
Factor 1: (SCA)					
Question 1	1.19	0.66	20.22	0.44	
Question 2	1.28	0.78	20.20	0.61	
Question 3	1.21	0.79	20.47	0.63	
Question 4	1.23	0.83	21.32	0.69	0.64
Question 5	1.29	0.76	19.79	0.58	
Question 6	1.36	0.87	22.04	0.75	
Question 7	1.25	0.83	21.15	0.68	
Factor 2: (PCA)					
Question 8	1.05	0.68	15.22	0.46	
Question 9	1.18	0.75	17.12	0.67	
Question 10	1.07	0.80	18.21	0.61	0.56
Question 11	1.17	0.78	18.47	0.65	
Question 12	1.01	0.55	15.84	0.41	
Factor 3: (IA)					
Question 13	1.22	0.79	30.18	0.76	
Question 14	1.21	0.78	33.32	0.75	
Question 15	1.18	0.68	22.74	0.57	0.63
Question 16	1.23	0.81	27.36	0.59	
Question 17	1.17	0.80	26.20	0.56	
Question 18	1.16	0.75	24.11	0.50	
Factor 4: (SEA)					
Question 19	1.03	0.75	19.56	0.55	
Question 20	1.25	0.84	23.53	0.70	0.62
Question 21	1.05	0.78	21.97	0.61	

Note. SCA = Shared Content Anxiety; PCA = Privacy Concern Anxiety; IA = Interaction Anxiety; SEA = Self-Evaluation Anxiety; R<sup>2</sup> = R-squared; AVE = Average Variance Extracted.

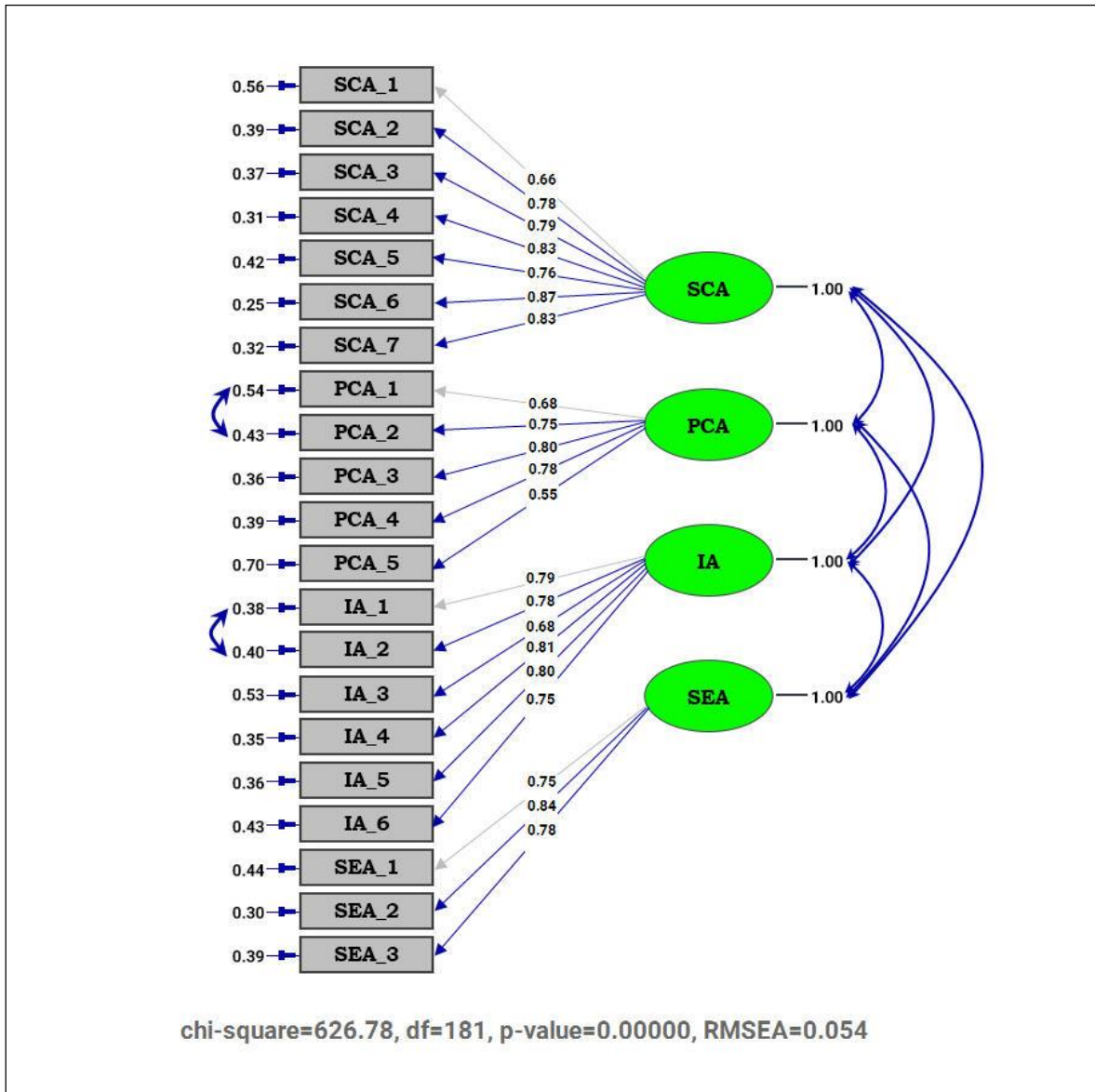


Figure 2. Standardized Coefficients for the Four-Factor Model of Social Anxiety Scale for Social Media Users

**Reliability**

Cronbach's alpha was applied to investigate the internal consistency of the SAS-SMU questions. It was 0.92 for the SCA subscale (questions 1 to 7), 0.85 for the PCA subscale (questions 8 to 12), 0.90 for the IA subscale (questions 13 to 18), 0.83 for the SEA subscale (questions 19 to 21), and Cronbach's alpha for the total scale was 0.93. These values, which were very close to those of the original version of the questionnaire, demonstrated acceptable internal consistency reliability. In addition, the composite reliability coefficient was calculated for each subscale. It was 0.95 for the SCA subscale, 0.87 for the PCA subscale, 0.92 for the IA subscale, 0.87 for the SEA subscale, and the composite reliability coefficient for the total scale was 0.97. Finally, the inter-rater reliability was calculated for each subscale. It was 0.78 for the SCA

subscale, 0.74 for the PCA subscale, 0.84 for the IA subscale, 0.98 for the SEA subscale, and Cronbach's Alpha Intraclass Correlation Coefficient for the total scale was 0.89 (Table 5).

In addition, the test-retest scores of 30 participants for all 4 subscales (SCA = 0.641, PCA = 0.773, IA = 0.688, SEA = 0.727) indicate acceptable stability of the questionnaire over time (Table 5).

**Convergent Validity**

The Beck Anxiety Inventory (BAI) was used to assess convergent validity and the convergent correlation coefficient of 0.411 was obtained. Such a correlation between the BAI and SAS-SMU scores is coded as an acceptable standard (74).



**Table 5. Reliability Index of Social Anxiety Scale for Social Media Users**

	Cronbach's Alpha	Composite Reliability	Intraclass Correlation Coefficient (ICC)	Test-Retest Score
Total score	0.931	0.975	0.889	0.772
SCA	0.920	0.954	0.776	0.641
PCA	0.846	0.867	0.741	0.773
IA	0.901	0.918	0.842	0.688
SEA	0.828	0.865	0.977	0.727

Notes: SCA = Shared Content Anxiety; PCA = Privacy Concern Anxiety; IA = Interaction Anxiety; SEA = Self-Evaluation Anxiety

## Discussion

The findings of the current study demonstrate that the Persian version of SAS-SMU has appropriate psychometric properties for use in the Persian-language population. It has an excellent internal consistency for all questions as well as each of the subscales. Moreover, there is some evidence that the psychometric properties of the Persian SAS-SMU are more similar to the original text than the Swedish version. For example, while the original version contains four factors (shared content anxiety, privacy concern anxiety, interaction anxiety, and self-evaluation anxiety), three factors were obtained from the exploratory factor analysis of the Swedish version (negative evaluation anxiety, interaction anxiety and anxiety regarding privacy concerns). In fact, factors SCA and SEA of the English (and also Turkish) SAS-SMU together form a general factor called negative evaluation in the Swedish questionnaire. The Swedish authors believe that this difference in factor structure may have occurred for two reasons (55): 1) cultural differences in the expression of social anxiety and 2) the difference in translation and meaning of some terms in different languages. For instance, in most sentences of the original version, the word "concern" is used while the word "worry" is used in the Swedish back-translation. According to Table 6 and comparing the Persian and Swedish back-translations with the original text, it does not seem to be an accurate explanation, because in our translation, the word "worry" is used instead of "concern" too. It should also be noted that the words "concern" and "worry" in the Persian language are so intertwined that they are simply used interchangeably, without the distinction made in Swedish sentences. For another example indicating the similarity between the Persian and original SAS-SMU, we can refer to item IA4 ("I feel tense when I meet someone for the first time"), which in the present study has an acceptable factor loading (0.83), while it has a factor loading of about 0.4 in the Swedish form. The Swedish authors have attributed it to the difference between the translation of the word "tense" in English and Swedish which may be associated to muscle tightness rather than worry or nervousness (55). The convergent validity of the Persian version of the SAS-SMU with the Beck Anxiety Inventory was

calculated, and a correlation coefficient of 0.41 was obtained. This moderate correlation can be explained in this way that although both questionnaires (BAI and SAS-SMU) are provided to measure anxiety, it is not expected that there would be a high correlation between the anxiety scores measured by the BAI and social anxiety scores of social media users. In fact, the Beck Anxiety Inventory focuses primarily on the bodily symptoms of anxiety, as evidenced by the fact that more than half of the questions are related to physical sensations such as insensibility and prickling, sensation of heat, shakiness and unsteadiness in legs, beating heart, hands trembling, face flushed, hot / cold sweats. In addition, some studies have shown that online communication is preferred to face-to-face interactions due to reduced physical symptoms of anxiety and the fear of negative evaluation; therefore, it is considered as a kind of avoidant and safe behavior (32, 75-79).

In contrast to previous studies showing that social anxiety is correlated with the excessive use of social media (34-37, 80), the results of this research did not indicate a strong correlation between the frequency of social media use ( $r = 0.093$ ) and average use ( $r = 0.144$ ) with SAS-SMU scores. This is consistent with the findings of two other versions of this scale (51, 55). A possible explanation for this result is that people who dedicate more time to social media activities are not necessarily more socially anxious, which means that the type of use should also be considered in relationship between the amount of wasted time on social networks and social anxiety. Two defined modes of social media use include: 1) active use (commenting, sharing contents, making content or sending pictures or movies) and 2) passive use (glancing through other's feeds, perusing comments, and watching videos/pictures without sending any comment or sharing any content). According to the research of the Swedish edition of the SAS-SMU, depending on the type of use, the degree of correlation between the SAS-SMU scores and time spent on social networks varies, with a stronger correlation observed among passive users compared to active users (55). Shaw and colleagues (2015) also confirmed that passive use is considered a significant predictor of social anxiety (81). Therefore, it can be concluded that people with high social anxiety may

prefer online communication to face-to-face interactions as a way to reduce and control anxiety symptoms such as physical symptoms (82). However, we should be mindful that this type of social anxiety measured by the SAS-SMU can even lead people to stay away from social media, rather than causing them to overuse it. This is because social media can increase anxiety and fear in socially anxious people, particularly due to concerns about negative evaluation, the possibility of storing and

reviewing the content shared by users, sending contents to others, disclosure of personal information, forwarding confidential messages and many other features that are not possible in face-to-face communication. In summary, social networking platforms appear to play a remarkable role in exacerbating, alleviating, and reshaping psychological problems such as social anxiety, which confirms the need for more investigations in future research.

**Table 6. Three Versions of the Factors Shared Content Anxiety and Self-Evaluation Anxiety**

<b>Original Questions</b>	
SCA	I feel anxious about the fact that others might find my actions awkward. I am concerned about being ridiculed by others for the content I have shared. I am concerned about the fact that the content I share will not be liked by others. I am afraid that my close friends will not approve of my behavior. I would feel uncomfortable when my friends publicly express their dislike about content I have shared. I am concerned about disapproval of my behaviors by others. I am concerned about being judged about my shared content by my friends in the presence of others.
SEA	I feel anxious about making a negative impression on people. I am concerned about people thinking poorly of me. I feel anxious about not being able to meet people's expectations.
<b>Back-Translated from Swedish into English</b>	
NEA	I worry about that others might think I do odd things I am worried about being mocked by others because of the content I have shared. I am worried about that the content I share will not be liked by others. I am afraid that my close friends will not accept my behavior. I would feel uncomfortable if my friends publicly expressed their disapproval about the content I have shared. I am worried about others disapproving of my behavior. I am worried about that my friends in the presence of others will judge me by the content I have shared. I feel worried about making a negative impression on others. I worry about that people will evaluate me negatively. I worry about not living up to people's expectations.
<b>Back Translated from Persian into English</b>	
SCA	The fact that my behavior is unconventional from the point of view of others makes me anxious. I'm worried that others will make fun of me for the content I share. I'm worried what I share will not be liked by others. I am afraid that my close friends will not approve of my behavior. I get upset when my friends publicly express their dislike about the content I share. I am worried that others will not approve of my behavior. I am worried that my friends will judge the content I have shared in the presence of others.
SEA	The fact that others have a bad impression of me makes me anxious. I'm worried that others will not have a good view of me. Being unable to live up to other people's expectations makes me anxious.

Notes: SCA = Shared Content Anxiety; SEA = Self-Evaluation Anxiety; NEA = Negative Evaluation Anxiety

**Limitation**

Since self-report limitation is common in psychological research due to participants' bias, it is suggested to use other tools such as observation and clinical interviewing as a complement to social anxiety assessment. In spite of the mentioned limitation, this study adds to the growing

body of data, confirming the validity and reliability of the SAS-SMU, allowing for assessing social anxiety among social media users.

## Conclusion

The purpose of the current research was to examine the psychometric criteria of the Iranian edition of the Social Anxiety Scale for Social Media Users (SAS-SMU). To achieve this goal, various steps of statistical analysis were performed carefully. By using exploratory factor analysis on half of the sample, 4 factors (similar to the original edition of the SAS-SMU) were obtained, and by employing confirmatory factor analysis on the second half of the sample, the mentioned 4 factors were confirmed (SCA, PCA, IA, SEA). The model fit indices, Cronbach's alpha, test-retest scores as well as the convergent correlation of the questionnaire with the Beck Anxiety Inventory confirm that the present scale has acceptable validity and reliability and is suitable to use in Iranian research.

## Acknowledgment

The authors would like to express their deep gratitude to the study participants for sharing their experiences and for their enthusiastic support in this study. It is also necessary to inform that this research received no financial support or specific grant from any funding agency.

## Conflict of Interest

None.

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