Ilkogretim Online - Elementary Education Online, Year; Vol 20 (Issue 5): pp. 707-719
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.05.75

Psychometric Testing of Social Interaction Anxiety Scale in Pakistani Context

Dr. Iqbal Ahmad, Lecturer, Department of Education, University of Malakand, Pakistan (Principal author)
Dr. Imtiaz Ahmad, Assistant Professor, Department of Journalism and Mass Communication University of Malakand, Pakistan
Dr. Faisal Khan, Assistant Professor, Department of Management Studies University of Sawabi, Pakistan
Dr. Muhammad Israr, Assistant Professor, Department of Sociology SBBU Sheringal, Pakistan
Dr. Zainab Qazi, Assistant Professor, Department of Psychology, University of Malakand, Pakistan
Dr. Arab Naz, Professor, Department of SociologyUniversity of Malakand Pakistan (Corresponding author arab_naz@yahoo.com)

Abstract- Numerous scales have been developed and used for measuring social interaction anxiety among students and educational professionals. Social Interaction Anxiety Scale (SIAS) is one such important measure that has been widely used around the world. However, little is known about its testing in Pakistani context. The present study examined the psychometric features and theoretical structure of the SIAS in Pakistani higher education context. Data were collected from 291 students from three public sector universities of Khyber Pakhtunkwa. The validation was conducted in two phases. In the first phase, Exploratory Factor Analysis (EFA) was performed to identify the factor structure and the underlying dimensions in the scale. Based on the Principal Component Analysis (PCA) a four factor model emerged consisting of 20 items. In the second phase, Confirmatory Factor Analysis (CFA) was performed to evaluate the four-factor hypothetical model based on Structural Equation Modeling. The results showed that SIAS is a valid and reliablescale. The findings of the present study supported the multidimensionality of the scale. The model indicated an excellent model fit for the 20 items scale that can be used for measuring social interaction anxiety among students in higher education. The limitations of the study along with conclusion and recommendations are provided for future research.

Keywords: social interaction anxiety scale, Pakistani context, higher education

I. INTRODUCTION

Social anxiety is defined a situation where individuals have fear of social interaction situations. It is a disorder that occurs because of some concern(Bögels *et al.*, 2010). This state of fear or disturbance could relate to embarrassment or an anxiety as a result of social interaction. Social anxiety may lead to stress and disorders called social anxiety disorder(Liu *et al.*, 2015). The Social Interaction Anxiety Scale (SIAS) is a measurement tool used for measuring social interaction anxiety and social performance anxiety. The scale consists of 20 items and has been used widely around the world. In earlier studies the scale has been used as a factor model(Kampmann *et al.*, 2016).

Research regarding the factor structure of SIAS varies from context to context and is not uniformed. Studies (Mattick & Clarke, 1998; Menatti *et al.*, 2015; Robinson *et al.*, 2013; Rytwinski *et al.*, 2009).Through a validation study, Mattick and Clarke (1998) havereported mixed results about the factor structure of SIAS as a measuring tool.For example, examined the factor structure of SIAS and declared it a single factor scale. Yet in another study, (Carleton *et al.*, 2014; Kupper & Denollet, 2012)explored three factors for the scale. Similarly, other researchers(Olivares *et al.*, 2009) have reported two factors for SIAS. Recently, some scholars (Gomez & Watson, 2017; Le Blanc *et al.*, 2014; Menatti *et al.*, 2015)and (Eidecker *et al.*, 2010)found three factors (fear of criticism and embarrassment, easy interaction, feel difficult to others) for the scale. Some studies have reported about the factor structure being more than two factors(Heidenreich *et al.*, 2011; Olivares *et al.*, 2001; Safren *et al.*, 1998).

The existing studies have used Exploratory Factor Analysis (EFA), Principal Component Analysis(PCA) and Confirmatory Factor Analysis (CFA) methods for assessment of the SIAS factor structure across communities and using different samples. The studies have reported good fit models with more than one factor for SIAS. On the contrary, Rodebaugh et al, (2006) reported about one factor model for SIAS. Some studies (Carleton *et al.*, 2009), (Heidenreich *et al.*, 2011) and (Safren *et al.*, 1998)have produced very poor fit model for the scale.

Few studied have indicated a high internal consistency for the scale with alpha values being as high as .70, .80(Brown *et al.*, 1997), (Mattick& Clarke, 1998) and (Osman *et al.*, 1998) but (Brown *et al.*, 1997; Mattick & Clarke, 1998)good discriminant and (Brown *et al.*, 1997)convergent validity. This shows there is enough evidence of the scale in terms of reliability,(Peters, 2000)discriminant and convergent validity statistics. However, the results are mixed and unclear. Some have reported about the one- factor model for the scale and some have highlighted SIAS as a two or three factor model. Keeping in view these results, it seems necessary to determine the factor structure of SIAS in Pakistani context. The results of existing studies conducted in other contextare mixed and unclear and hence cannot be applied confidently Pakistani context without further testing the scale as the new testingof the scale would help in better understanding of the factor structure of scalein the current social setting.

Rationale for the Study

Furthermore, overall analysis of the assessment of SIAS based on different sample both from community and clinical as discussed above has showed mixed and unclear results. There is no clear support for the factor model from higher education field which is very important in terms of social interaction of students in Pakistani context. The existing studies have been mostly conducted in the developed world context which has a different social infrastructure. There is a need to test the factor structure of SIAS in Pakistani context. The results of the study would provide new direction to teachers about the importance of social interaction anxiety among students and how to overcome it for their better social development. The findings of the study also provides new vistas of research to researchers on psychometric property evaluation of the scale, it internal consistency, concurrent or discriminant validity in new context for better understanding the factor structure of the scale. To date, no research has been done for assessing the factor structure of SIAS in higher education context of Pakistan. The current study aimed to evaluate the psychometric properties of SIAS in Pakistani context and social setting being different from previous settings in which the scale was tested.

Research Objectives

Following were the main objectives of this study.

1. To explore the factor structure of SIAS in the context of Pakistan by using EFA approach.
2. To evaluate the hypothesized factor structure of SIAS in the context of Pakistan by using CFA.
3. To determine convergent and discriminant validity of the scale

II. METHOD

Sample

For conducting the present explorative study, a sample of 423 students comprising of 198 males (%) and females 125 were conveniently sampled from three public sector universities of Khyber Pakhtunkhwa. The students were sampled from department of social work (n=108), teacher education (n=105) and pharmacy (n=110). The different fit models analyses were done based on these samples.

Measure

The Social Anxiety Scale (SIAS) was used to assess the social interaction anxiety among students of Pakistani higher education. The scale was originally developed by Mattick and Clarke (1998) for measuring social interaction anxiety. The scale consists of 20 items on five point Likert scale with ranges 0 (*not at all characteristics of me*) to 4 (*extremely characteristics of me*). Based on the data higher score means higher level of social interaction anxiety among the students. The scale showed good reliability in previous research (Mattick and Clarke, 1998). The overall Cronbach's alpha internal consistency value for the 20 items SIAS in the present study was .96.

Procedure for data collection

For recruiting the students, permission was obtained from the departments of the university concerned before data collection. Individual consent of the participants was also taken before sending them the questionnaires. Convenient sampling technique was used for collecting data from the participants being an easy method to access the available students who wanted to participate based on their willingness. As an ethical consideration, the participants were given information statement related to the objectives of the research to enable them to understand the aim and nature of the research. The students were accessed through departmental permission. The completed questionnaires were received through individually from each student via postal address after being filled anonymously by the participants.

Data analysis

The collected were subjected to different statistical methods. Descriptive statistics was used for preparing and organizing the collected data by using means and standard deviation (SD) on SPSS version 20. Factor analysis was used for exploring the dimensions of the scale by using Exploratory Factor Analysis (EFA). Principal Component Analysis (PCA) was used for indentifying the factor structure form the data based on orthogonal Varimax Rotation. Eignenvalues more than 1 was used as technique to select the factors. Threshold value .40 was used to retain or delete items from the scale. The identified factor structure was tested through Confirmatory Factor Analysis (CFA) on AMOS version 18. The goodness of fit was determined based on different model fit statistics such asχ^2, df, GFI, AGFI, CFI, TLI, NFI and RMSEA (Hu & Bentler, 1998; West *et al.*, 2012).

Procedure for analysis

The analysis was conducted in different stages. Before conducting analysis, the data was subjected to statistical exercise to find out data normality. For this purpose, kurtosis and skewness was tested on SPSS version 20. In the first stage, the scale was piloted among the targeted students. The reliability of the scale was determined based on Cronbach's alpha internal consistency. The item total correlation with .40 criteria was used for retaining or deleting items in the scale as mentioned above. The scale was distributed among 30 participants recruited conveniently from one university. In the second phase, EFA was conducted for identifying the factor structure of the scale as described above. In the third phase, the hypothesized factor structure was tested and confirmed based on CFA approach by Sequential Equation Modeling (SEM) method on AMOS version 18(Hair *et al.*, 2006). The SEM method is useful to explain the complex relationship among the variables. The convergent and discriminant validity was determined based on Average Variance Extraction (AVE) method and correlation among the variables.

Pilot Testing

Pilot testing was done for psychometric cleansing of the items. The means ranged from M=3.62 to M= 4.34. For ascertaining the normality of data based on the present sample, Shapiro-Wilk test was performed. The analysis 30= 0.96,>.05 showed that the data met the criteria of normal distribution, as the values were within acceptable ranges (Coaks& Steed, 2003). The item exclusion was done based on kurtosis was within the range |3| and skewness not more than |8| indicates. No item was excluded based on the criteria. The results of descriptive statistics for means, standard deviation are shown in Table 1

Table 1: Means and Standard Deviations of responses for 20 items SIAS

Items		Mean	SD
1	I get nervous if I have to speak with someone in authority (teacher, boss, etc.)	4.30	.803
2	I have difficulty making eye contact with others	4.28	.758
3	I become tense if I have to talk about myself or my feelings	4.27	.790
4	I find it difficult to mix comfortably with the people I work with	4.13	.864
5	I find it easy to make friends my own age	3.93	.961
6	I tense up if I meet an acquaintance in the street	4.19	.799

7	When mixing socially, I am uncomfortable	4.14	.911
8	I feel tense if I am alone with just one other person	4.10	.900
9	I am at ease meeting people at parties, etc	4.10	.874
10	I have difficulty talking with other people	4.00	.970
11	I find it easy to think of things to talk about	4.24	.999
12	I worry about expressing myself in case I appear awkward	4.34	.786
13	I find it difficult to disagree with another's point of view	4.22	.859
14	I have difficulty talking to attractive persons of the opposite gender	4.01	.843
15	I find myself worrying that I won't know what to say in social situations	4.10	.887
16	I am nervous mixing with people I don't know well	4.25	.828
17	I feel I'll say something embarrassing when talking	3.67	1.067
18	When mixing in a group, I find myself worrying I will be ignored	3.62	1.063
19	I am tense mixing in a group	3.78	1.075
20	I am unsure whether to greet someone I know only slightly	3.70	1.111

III. RESULTS

Phase 1: Exploratory Factor Analysis

In this stage of the study, EFA was conducted for exploring the factor structure of the scale and its dimensions in Pakistani higher education context. The Kaiser-Meyer-Olkin (KMO) measure to test sample adequacy was at an acceptable level .96 along with the Bartlett's Test of Sphericity significant at $\chi 2(190, n = 291) = 14799.783$, $p<.000$ indicating factor analysis to be an appropriate method for analysis as shown in Table 2

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.960
Bartlett's Test of Sphericity	Approx. Chi-Square	14799.783
	Df	190
	Sig.	.000

The factors were retained based on Screeplothaving loadings greater than .40 and eigen values greater than 1 as shown in Figure 1.

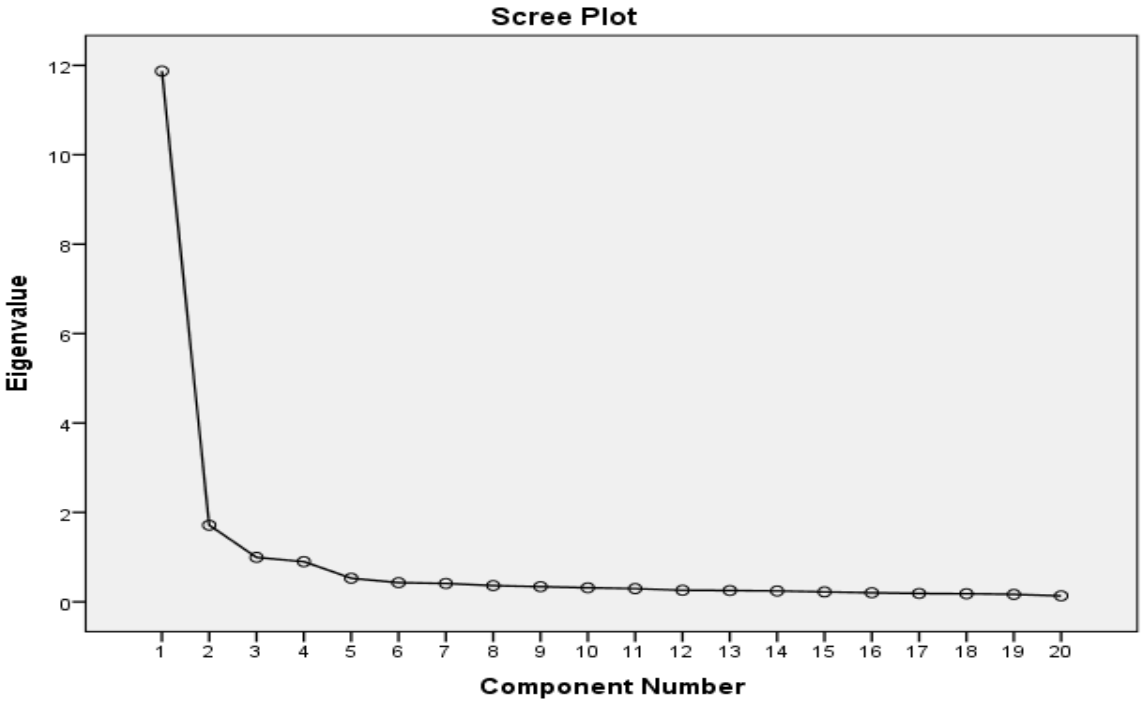

Figure 1

The 20 items social interaction anxiety scale was analyzed based on data collected from 291 students from three universities in Khyber Pakhtunkhwa Pakistan. The application EFA approach along with PCA method yielded a four factor model using varimax rotation.All the items were retained being above .40 in the 20 items scale. The four factors extracted together explained 77.83% of the total variance in the scale. Factor 1 was named 'Feel Isolated' based on the nature of the items 6 to 10. This factor individually explained 24% of the variance in the scale. The second factor was named 'Poor Communication' based on the items 6 to 10. This factor explained 19% of the variance in the scale. The third factor was named 'Little Interaction' based on items 11 to 15 having 18.30% variance in the scale. The fourth factor was named 'Poor Confidence' based on the items from 16 to 20 having 16.18% of the variance in the scale.

Table 3: Total variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.871	59.357	59.357	4.792	23.961	23.961
2	1.714	8.568	67.925	3.786	18.932	42.893
3	1.995	4.973	72.897	3.662	18.308	61.201
4	1.898	4.488	77.385	3.237	16.184	77.385
5	.728	3.638	80.023			
6	.528	2.140	82.164			
7	.411	2.054	84.218			
8	.362	1.810	86.027			
9	.340	1.698	87.725			
10	.315	1.574	89.299			
11	.295	1.477	90.776			

12	.259	1.293	92.069			
13	.253	1.264	93.333			
14	.242	1.212	94.545			
15	.222	1.108	95.654			
16	.202	1.012	96.666			
17	.187	.933	97.599			
18	.180	.901	98.500			
19	.166	.829	99.329			
20	.134	.671	100.000			

The rotated component matrix shows factor loadings for all the factors individually in the scale. The factor loadings indicate that the values of all variables were above .40 being at an acceptable level (Hinkin, 1995). The variables6 to 10 loaded on factor 1 with factor loadings ranging .71 to .79. Variables 16 to 20 loaded on factor two with factor loadings ranging from .47 to .79. Variables 11 to 15 loaded on factor three with factor loadings ranging from .44 to .79. Variables 1 to 5 loaded on factor 1 with factor loadings ranging from .70 to .81 in the scale as shown in Table 4.

Table 4: Rotated Component Matrix[a]

	Component			
	1	2	3	4
sta1				.751
sta2				.814
sta3				.719
sta4				.703
sta5				.796
sta6	.796			
sta7	.710			
sta8	.717			
sta9	.779			
sta10	.775			
sta11			.446	
sta12			.748	
sta13			.775	
sta14			.798	
sta15			.608	
sta16		.470		
sta17		.791		
sta18		.781		
sta19		.741		
sta20		.758		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Phase 2: Confirmatory Factor Analysis

In the next stage, the multi-dimensionality of scale was assessed using CFA approach. The 20 items instrument with the four factor model was subjected to analysis on AMOS version 18. The model fit of the measurement model was checked based on fit indices chi-square, DF, GFI, AGFI, CFI, TLI and RMSEA (Hair et al, 2010). The measurement model indicates that all the factor loadings were above .40 meeting the required range (Hair et al, 2010) shown in Figure 1.

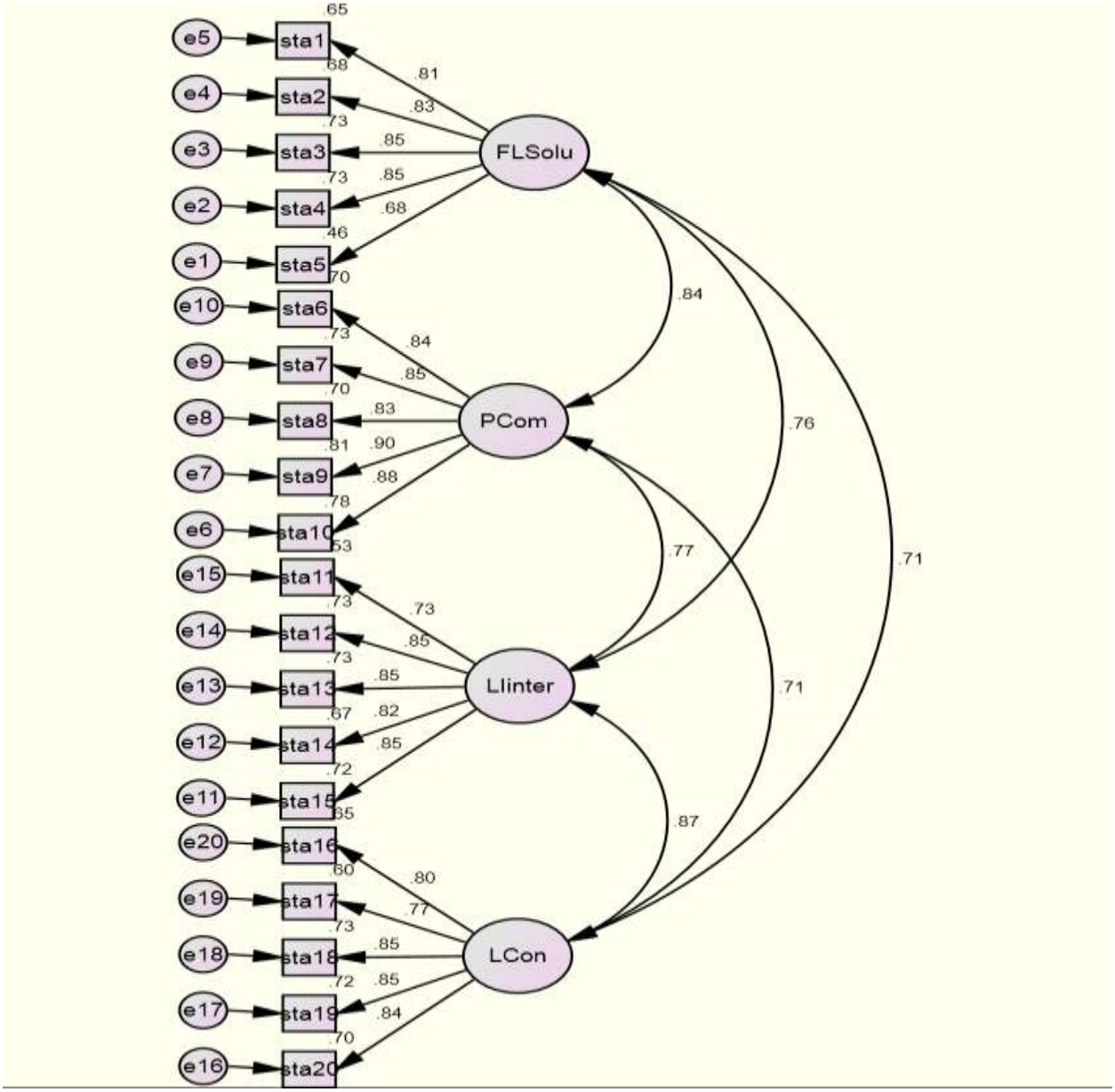

Figure 2

As indicated in Table 4 goodness of fit indices for the SIAS show that that all values are within acceptable ranges as $\chi 2$= 158.30, Df= 164, CMIN/DF= 9.66, GFI= .937, AGFI= .891, TLI= .888, NFI= .894, CFI= .940 RMR= .056 and RMSEA= .103 (Hair *et al*., 2010).The CFA results shows that based on the guidelines of Hu and Bentler (1998), the RMSEA value showed an acceptable fit, the GFI and AGFI also indicated an good fit. The values of TLI, CFI and NFI also showed a good fit. Together all the values provided supportive evidence for the multi-dimensionality of the four factor model for SIAS.

Table 4: Goodness of Fit Indices

Model Fit	Fitness Indices	Threshold Values	Achieved Values
	$\chi 2$=	----	158.30
	Df	----	164
	CMIN/df	<.5	9.66

Goodness of Fit	GFI	>.90	.937
	AGFI	>.80	.891
	TLI	>.90	.888
	CFI	>.900	.940
	NFI	>.90	.894
Badness of Fit	RMR	<.050	.056
	RMSEA	<.080	.103

Convergent Validity

Table 5 indicates that factor loadings for SIAS are above .50 showing the evidence based on Average Variance Extraction (AVE) for all variables within the acceptable rangebetween 0.65 to 0.74 for convergent validity and construct reliability (CR) ranging0.91 to 0.93.

Table 5: Convergent Validity of SIAS

Dimensions	Items	Factor Loading	CR	AVE
Feel Isolated (FLSolu)	sta6	.796	0.90	0.65
	sta7	.710		
	sta8	.717		
	sta9	.779		
	sta10	.775		
Poor Communication (PCom)	sta16	.470	0.93	0.74
	sta17	.791		
	sta18	.781		
	sta19	.741		
	sta20	.758		
Little Interaction (LInter)	sta11	.446	0.91	0.67
	sta12	.748		
	sta13	.775		
	sta14	.798		
	sta15	.608		
Poor Confidence (PCon)	sta1	.751	0.91	0.67
	sta2	.814		
	sta3	.719		
	sta4	.703		
	sta5	.796		

FLSolu= Feel Isolated, PCom= Poor Communication, Linter=Little Interaction, LCon

Discriminant Validity

The Table indicates that all the variables have adequate discriminant validity. The square root of AVE is greater than the inter-construct correlations of each of the variables. The inter construct correlations are less than .85 (Hair *et al.,* 2006) providing an evidencefor discriminant validity of SIAS.

Table 6: Discriminant Validity for SIAS

Dimensions	CR	AVE	FLSolu	PCom	LInter	PCon
FLSolu	0.90	0.65	(0.806)			
PCom	0.93	0.74	0.837	(0.862)		
LInter	0.91	0.67	0.761	0.837	(0.851)	

PCon	0.91	0.67	0.706	0.812	0.832	(0.860)

* Square root of AVE is shown in parenthesis

The 20 items scale and its four dimensions were subjected to further calculation for reliability analysis on SPSS version 20. The Cronbach's alpha coefficient for the total items was .96 and the dimensions were .80=Feel Isolated, .93= poor Communication, Little Interaction =.90 and Poor Confidence = .91respectively. The item-total correlation analysis was also performed on the total 20 items for determining the proportion of correlation of each of the item with the total score of the scale as shown in Table 7.

Table 7: Item-Total Correlation, Mean (M), Standard Deviation (SD) and Alpha

Dimensions	Items	Item-Total Correlation	M	SD	alpha
Feel Isolated (FLSolu)	sta6	.796	4.04	.991	.80
	sta7	.710	4.27	.911	
	sta8	.717	4.18	.944	
	sta9	.779	4.14	.976	
	sta10	.775	4.20	.922	
Poor Communication (PCom)	sta16	.470	4.03	1.055	.93
	sta17	.791	4.03	1.023	
	sta18	.781	4.10	.992	
	sta19	.741	4.00	1.010	
	sta20	.758	3.99	1.018	
Little Interaction (LInter)	sta11	.446	4.03	.978	.90
	sta12	.748	3.96	1.015	
	sta13	.775	3.98	1.003	
	sta14	.798	4.06	.956	
	sta15	.608	4.08	.942	
Poor Confidence (PCon)	sta1	.751	4.17	.985	.91
	sta2	.814	3.96	1.054	
	sta3	.719	3.98	1.063	
	sta4	.703	3.86	1.071	
	sta5	.796	4.16	.936	
			4.24	.921	

IV. Discussion and Implications

The main aim of this study was to examine the factor structure of SIAS in the context of Pakistani. The earlier findings reported mixed fit for the one-factor model in other contexts studies (Carleton *et al.*, 2009; Olivares *et al.*, 2001) and (Heidenreich *et al.*, 2011). This study was the first of its kind in Pakistani higher education context. The findings of testing of the 20 items scale through EFA and PCA methods indicated that SIAS is a four factor scale. These factors were feel isolated, poor communication, little interaction and poor confidence. The total scale accounted for 77.38% of the total variance. The internal consistency reliability values of the scale also indicated good alpha .80, .93, .90 and .91 for the four dimensions. According to Hinkin (1995) values above .70 are preferred for meaningful interpretation of scale reliability. The model fit results also indicated better evidences for the construct validity of the scale. The results for convergent (AVE =.65 to .74 and CR = .91 to .93) and discriminant validity were also within the acceptable ranges Overall the results of the study show that SIAS is 20 items four factor model. The results of this study are not fully consistent with previous findings(Furmark *et al.*, 2000; Safren *et al.*, 1998; Zubeidat *et al.*, 2007); as these studies have reported about SIAS to be either one factor model or two factor model. However, on the contrary, in the context of the current study, a multiple four factor model emerged based on PCA analysis. Even, the results of

this study cannot be generalized in Pakistani higher education context as there were no clear evidences of its testing in Pakistan before this study. However, the findings of this study have wider implications. The study supported the four factor model for SIAS to be a useful scale for measuring social interaction anxiety among students of higher education.

The findings of this study have also far reaching theoretical and clinical implications relating to social anxiety issues among students especially at higher education level in Pakistan and elsewhere. Firstly, the first factor of this study is related to feeling of isolation. Based on the results of this study it can be argued that students suffering from social anxiety go in social isolation. They do not mix with others and try to avoid the company of others. This finding fully supports the results of previous studies(Cacioppo *et al.*, 2011; Ma *et al.*, 2011) that anxiety leads to social isolation and separation. Second, this study found poor communication as the second factor. This result is also consistent with previous findings(DordiNejad *et al.*, 2011; Vitasari *et al.*, 2010)that students suffering from anxiety have low academic performance. Such students feel dejected to share their views openly or ask questions. The third factor that this study identified was little interaction as dimension of social interaction anxiety. Researchers (Abel & Larkin, 1990; Beck *et al.*, 2005; Kenow & Williams, 1992)have already argued that those individuals who suffer any type of anxiety would be freely and confidently interact with others. Moreover, this study further found poor confidence another dimension of social interaction anxiety. This result also supports the findings of previous studies (Bowlby, 2010; Bowlby, 1960)that anxiety breeds social separation among individuals. It reduces the aspirations of individuals and finally culminates in social isolation. Studies (Auerbach *et al.*, 2016; Azher *et al.*, 2014; Beiter *et al.*, 2015; Mazhari, 2012)have already reported about numerous cases of social interaction issues among students and highlighted the need to address this issue. The results of this study also add to the existing literature on social interaction anxiety. The measure can be used in the field of clinical practice, education, and social research. The results of this study provide a theoretical support to the nature of social anxiety construct as a multi-nature phenomenon because social anxiety has already been widely viewed in the existing literature as a continuous trait associated with a number of specifications such as cognitive-affective, physiological, attitudinal and attention issues.

V. LIMITATIONS

The findings of this study are subjected to limitations. The data were collected from threepublic sector universities in Khyber Pakhtunkwa province. Pakistan is a multicultural and multilingual country. The results cannot be generalized to other provinces due to socio-economic and cultural reasons. Second, the sample was taken from general student community. The findings here could be biased to other samples such as clinical sample or those who were diagnosed with social interaction anxiety. Third, the format of questionnaire for data collection was based on five point Likert scale which has its own weaknesses. Fourth, convenience sample was used in the study. It is possible that demographic factors such as gender and nature of course undertaken such as pharmacy, social work and teacher education. The failure to control these important factors could have affected the results. However, it is to be noted here that earlier research has not found any significant difference based on gender for SIAS(Caballo *et al.*, 2013; Olivares *et al.*, 2001). As the ratio of sample was lees for model factor analysis, however, researchers have suggested that there is rule of thumb, however, sample more than 200 with a ratio of 4:1 is considered satisfactory for CFA(Brown & Moore, 2012).Based on this further validation of the SIAS is recommended using more robust sample for better generalizations of the results. It is suggested that more studies could be conducted in this area by considering the limitations mentioned here so that better factor structure could be determined for SIAS as an important measurement tool.

VI. CONCLUSION

Social anxiety is a multi-dimensional construct. It is not a single construct. The results of this study will help clinicians and career counselors to understand the multiple factors influencing or causing social interaction anxiety among students. This study also provides new insights to researchers to study social anxiety as a multiple dimensional construct not a one-dimensional construct. The study also enhances the understanding of teachers regarding the different aspects of anxiety and its indicators. There is a clear need to study social

anxiety as a multiple construct so that better and viable solutions could be provided to students suffering from social interaction anxiety. It is important to treat the problem before it completely engulfs the personality of the person as people suffering anxiety would be able to positively contribute towards the development of society.

REFERENCES

1. Abel, J. L., and Larkin, K. T. (1990). Anticipation of performance among musicians: Physiological arousal, confidence, and state-anxiety. *Psychology of music,* 18(2), 171-182.
2. Auerbach, R. P., Alonso, J., Axinn, W. G., Cuijpers, P., Ebert, D. D., Green, J. G., . . . Mortier, P. (2016). Mental disorders among college students in the World Health Organization world mental health surveys. *Psychological medicine,* 46(14), 2955-2970.
3. Azher, M., Khan, R. B., Salim, M., Bilal, M., Hussain, A., and Haseeb, M. (2014). The relationship between internet addiction and anxiety among students of University of Sargodha. *International Journal of Humanities and Social Science,* 4(1), 288-293.
4. Beck, A. T., Emery, G., and Greenberg, R. L. (2005). *Anxiety disorders and phobias: A cognitive perspective*: Basic Books.
5. Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., and Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of affective disorders,* 173, 90-96.
6. Bögels, S. M., Alden, L., Beidel, D. C., Clark, L. A., Pine, D. S., Stein, M. B., and Voncken, M. (2010). Social anxiety disorder: questions and answers for the DSM-V. *Depression and anxiety,* 27(2), 168-189.
7. Bowlby, E. (2010). *Separation: Anxiety and anger: Attachment and loss* (Vol. 2): Random House.
8. Bowlby, J. (1960). Separation anxiety. *International Journal of Psycho-Analysis,* 41, 89-113.
9. Brown, E. J., Turovsky, J., Heimberg, R. G., Juster, H. R., Brown, T. A., and Barlow, D. H. (1997). Validation of the Social Interaction Anxiety Scale and the Social Phobia Scale across the anxiety disorders. *Psychological assessment,* 9(1), 21.
10. Brown, T. A., and Moore, M. T. (2012). Confirmatory factor analysis. *Handbook of structural equation modeling*, 361-379.
11. Caballo, V. E., Salazar, I. C., Irurtia, M. J., Arias, B., and Nobre, L. (2013). THE ASSESSMENT OF SOCIAL ANXIETY THROUGH FIVE SELFREPORT MEASURES, LSAS-SR, SPAI, SPIN, SPS, AND SIAS: A CRITICAL ANALYSIS OF THEIR FACTOR STRUCTURE. *Psicología Conductual,* 21(3), 423.
12. Cacioppo, J. T., Hawkley, L. C., Norman, G. J., and Berntson, G. G. (2011). Social isolation. *Annals of the New York Academy of Sciences,* 1231(1), 17-22.
13. Carleton, R. N., Collimore, K. C., Asmundson, G. J., McCabe, R. E., Rowa, K., and Antony, M. M. (2009). Refining and validating the social interaction anxiety scale and the social phobia scale. *Depression and anxiety,* 26(2), E71-E81.
14. Carleton, R. N., Thibodeau, M. A., Weeks, J. W., Teale Sapach, M. J., McEvoy, P. M., Horswill, S. C., and Heimberg, R. G. (2014). Comparing short forms of the Social Interaction Anxiety Scale and the Social Phobia Scale. *Psychological assessment,* 26(4), 1116.
15. DordiNejad, F. G., Hakimi, H., Ashouri, M., Dehghani, M., Zeinali, Z., Daghighi, M. S., and Bahrami, N. (2011). On the relationship between test anxiety and academic performance. *Procedia-Social and Behavioral Sciences,* 15, 3774-3778.
16. Eidecker, J., Glöckner-Rist, A., and Gerlach, A. L. (2010). Dimensional structure of the Social Interaction Anxiety Scale according to the analysis of data obtained with a German version. *Journal of Anxiety Disorders,* 24(6), 596-605.
17. Furmark, T., Tillfors, M., Stattin, H., Ekselius, L., and Fredrikson, M. (2000). Social phobia subtypes in the general population revealed by cluster analysis. *Psychological medicine,* 30(6), 1335-1344.
18. Gomez, R., and Watson, S. D. (2017). Confirmatory Factor Analysis of the Combined Social Phobia Scale and Social Interaction Anxiety Scale: Support for a Bifactor Model. *Frontiers in psychology,* 8, 70.
19. Hair, J., Black, W., Babin, B., Anderson, R., and Tatham, R. (2006). SEM: confirmatory factor analysis. *Multivariate data analysis. Pearson Prentice Hall, Upper Saddle River*, 770-842.

20. Heidenreich, T., Schermelleh-Engel, K., Schramm, E., Hofmann, S. G., and Stangier, U. (2011). The factor structure of the social interaction anxiety scale and the social phobia scale. *Journal of Anxiety Disorders,* 25(4), 579-583.
21. Hinkin, T. R. (1995). A review of scale development practices in the study of organizations. *Journal of management,* 21(5), 967-988.
22. Hu, L.-t., and Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological methods,* 3(4), 424.
23. Kampmann, I. L., Emmelkamp, P. M., Hartanto, D., Brinkman, W.-P., Zijlstra, B. J., and Morina, N. (2016). Exposure to virtual social interactions in the treatment of social anxiety disorder: A randomized controlled trial. *Behaviour research and therapy,* 77, 147-156.
24. Kenow, L. J., and Williams, J. M. (1992). Relationship between anxiety, self-confidence, and evaluation of coaching behaviors. *The Sport Psychologist,* 6(4), 344-357.
25. Kupper, N., and Denollet, J. (2012). Social anxiety in the general population: introducing abbreviated versions of SIAS and SPS. *Journal of affective disorders,* 136(1-2), 90-98.
26. Le Blanc, A. L., Bruce, L. C., Heimberg, R. G., Hope, D. A., Blanco, C., Schneier, F. R., and Liebowitz, M. R. (2014). Evaluation of the psychometric properties of two short forms of the social interaction anxiety scale and the social phobia scale. *Assessment,* 21(3), 312-323.
27. Liu, F., Guo, W., Fouche, J.-P., Wang, Y., Wang, W., Ding, J., . . . Zhang, W. (2015). Multivariate classification of social anxiety disorder using whole brain functional connectivity. *Brain Structure and Function,* 220(1), 101-115.
28. Ma, X.-c., Jiang, D., Jiang, W.-h., Wang, F., Jia, M., Wu, J., . . . Gao, C.-g. (2011). Social isolation-induced aggression potentiates anxiety and depressive-like behavior in male mice subjected to unpredictable chronic mild stress. *PLoS one,* 6(6), e20955.
29. Mattick, R. P., and Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour research and therapy,* 36(4), 455-470.
30. Mazhari, S. (2012). Association between problematic Internet use and impulse control disorders among Iranian university students. *Cyberpsychology, Behavior, and Social Networking,* 15(5), 270-273.
31. Menatti, A. R., Weeks, J. W., Carleton, R. N., Morrison, A. S., Heimberg, R. G., Hope, D. A., . . . Liebowitz, M. R. (2015). The Social Interaction Phobia Scale: Continued support for the psychometric validity of the SIPS using clinical and non-clinical samples. *Journal of Anxiety Disorders,* 32, 46-55.
32. Olivares, J., García-López, L. J., and Hidalgo, M. D. (2001). The social phobia scale and the social interaction anxiety scale: factor structure and reliability in a Spanish-speaking population. *Journal of Psychoeducational Assessment,* 19(1), 69-80.
33. Olivares, J., Sánchez-García, R., and López-Pina, J. A. (2009). The Liebowitz social anxiety scale for children and adolescents. *Psicothema,* 21(3), 486-492.
34. Osman, A., Gutierrez, P. M., Barrios, F. X., Kopper, B. A., and Chiros, C. E. (1998). The social phobia and social interaction anxiety scales: evaluation of psychometric properties. *Journal of Psychopathology and Behavioral Assessment,* 20(3), 249-264.
35. Peters, L. (2000). Discriminant validity of the social phobia and anxiety inventory (SPAI), the social phobia scale (SPS) and the social interaction anxiety scale (SIAS). *Behaviour research and therapy,* 38(9), 943-950.
36. Robinson, J. P., Shaver, P. R., and Wrightsman, L. S. (2013). *Measures of personality and social psychological attitudes: Measures of social psychological attitudes* (Vol. 1): Academic Press.
37. Rytwinski, N. K., Fresco, D. M., Heimberg, R. G., Coles, M. E., Liebowitz, M. R., Cissell, S., . . . Hofmann, S. G. (2009). Screening for social anxiety disorder with the self-report version of the Liebowitz Social Anxiety Scale. *Depression and anxiety,* 26(1), 34-38.
38. Safren, S. A., Turk, C. L., and Heimberg, R. G. (1998). Factor structure of the social interaction anxiety scale and the social phobia scale. *Behaviour research and therapy,* 36(4), 443-453.
39. Vitasari, P., Wahab, M. N. A., Othman, A., Herawan, T., and Sinnadurai, S. K. (2010). The relationship between study anxiety and academic performance among engineering students. *Procedia-Social and Behavioral Sciences,* 8, 490-497.
40. West, S. G., Taylor, A. B., and Wu, W. (2012). Model fit and model selection in structural equation modeling. *Handbook of structural equation modeling,* 1, 209-231.

41. Zubeidat, I., Salinas, J. M., Sierra, J. C., and Fernández-Parra, A. (2007). Psychometric properties of the Social Interaction Anxiety Scale and separation criterion between Spanish youths with and without subtypes of social anxiety. *Journal of Anxiety Disorders,* 21(5), 603-624.