

Study Anxiety Sources Scale: Urdu Translation and Validation in Pakistani Culture

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ABSTRACT

The purpose of this study was to translate Study Anxiety Sources Scale in Urdu and validate in the Pakistani culture. The linguistic equivalence and cultural appropriateness of the translated materials were confirmed using a systematic forward-backward process of translation and the test-retest method with the participants. The sample consisted of 430 students of the universities of Pakistan recruited using convenience sampling and data was obtained from them through an online survey. The Urdu version of Study Anxiety Sources Scale showed acceptable overall internal consistency of the scale with Cronbach's alpha .878 for a 40 item scale. The Internal Consistency Reliability (ICR) of the subscales were acceptable to good with the scores of Examination Anxiety = .658, Language Anxiety = .665, Mathematics Anxiety = .548, Social Anxiety = .735, Presentation Anxiety = .696 and Library Anxiety = .758, except for Mathematics Anxiety that had relatively low internal consistency. The factor structure was confirmed by Confirmatory Factor Analysis. The model fit indices indicated an acceptable to good fit, with $\chi^2/df = 1.418$, IFI = .905, TLI = .894, CFI = .903, and RMSEA = .031. Based on these values, the proposed multidimensional structure was reasonably represented in the observed data. The psychometric analysis also supported construct validity as the composite reliability values ranged from .630 to .741, which is regarded as acceptable level of consistency of latent dimensions. The Average Variance Extracted, however, was not high enough than the generally recommended threshold and therefore limited convergent validity and should be interpreted with caution. The Urdu version of the Study Anxiety Sources Scale is a potentially valuable tool for measuring various sources of study related anxiety in Pakistani university students, but should be further validated with more diverse and representative samples.



Introduction

A psychological phenomenon that has received much attention in the psychological literature is anxiety, which is considered to be one of the key emotions associated with stress and perceived inability to cope effectively with environmental demands (Freud, 1926; Spielberger, 1972; Rachman, 1998; Öhman, 2000). According to modern theories, anxiety is an affective-cognitive process that encompasses the components of over-thinking, fear anticipation and physiological arousal to stressors (Barlow, 2002; Beck et al., 1985; Clark & Beck, 2010; Craske et al., 2009). Anxiety is seen as arising from the appraised incongruity of the demands placed on an individual and their coping resources (Lazarus & Folkman, 1984) and is further supported by subsequent stress appraisal research (Folkman & Moskowitz, 2004; Lazarus, 1999).

Study anxiety is a multifaceted psychological phenomenon that has been linked to the occurrence of emotional, cognitive, behavioral, and physiological symptoms during learning and educational processes (Zeidner, 1998; Spielberger & Vagg, 1995). In educational psychology, anxiety is usually considered a state of fear, nervousness, and worry that results from the perception of threat associated with educational activities and assessments (Sarason, 1984). Students at universities are constantly facing various stressors that play a significant role in the development of study anxiety, including exams, public speaking, studies, competition with other students, and new surroundings (Vitasari et al., 2010; Bayram & Bilgel, 2008). Low anxiety levels have been found to have a positive impact on motivation and concentration, while high anxiety levels have been found to have a negative impact on concentration, attention, emotional control and mental health (Cassady & Johnson, 2002; Putwain, 2007).

Exam experiences, assessment, classroom interactions and employment opportunities are typically perceived as threats by students in educational environments, triggering emotional and physiological reactions (Zeidner, 1998; Misra & McKean, 2000; Pekrun, 2006; Cassady, 2010; Putwain, 2007). As a result of its detrimental impact on academic performance, mental health and well-being, anxiety in university students is an emerging field of study (Deb et al., 2015; Beiter et al., 2015; American College Health Association, 2018; Richardson et al., 2012).

University life is considered a transition phase that involves academic pressure, personal development, adaptation to a new environment, financial issues, and many other factors, which can cause higher anxiety (Dyson & Renk, 2006; Friedlander et al., 2007; Conley et al., 2013). Academic research shows that university students who suffer from high study anxiety have a greater tendency to experience emotional exhaustion, poor academic results, low self-esteem, sleep problems, and psychological maladjustment (McCraty et al., 2000; Rana & Mahmood, 2010; Pascoe et al., 2020; Eisenberg et al., 2009).

Based on theoretical and empirical knowledge, study anxiety can be considered a multidimensional experience that can manifest under various conditions in relation to different stressors (Vitasari et al., 2010; Putwain, 2007; Zeidner, 1998; Cassady, 2010). The most common forms of anxiety include examination, mathematics, language, public speaking, social, family, and library anxiety (McCraty, 2007; Onwuegbuzie & Jiao, 2004; Tobias, 1985; Hembree, 1988). Although there are certain differences in the cognitive and emotional aspects of these anxiety dimensions, they all negatively affect university students' academic success and learning processes (Eysenck et al., 2007; Pekrun, 2006; Zeidner & Matthews, 2005).

Out of these factors, examination anxiety is probably the most thoroughly researched form of academic anxiety. The term examination anxiety stands for severe fear and nervousness related to test situations and academic failure (Zeidner, 1998; Spielberger & Vagg, 1995; Hembree, 1988; McDonald, 2001). Students suffering from high examination anxiety tend to face problems with

concentration, distracting thoughts, poor working memory, and retrieval of previously learned information when taking examinations (Eysenck et al., 2007; Owens et al., 2008). High levels of examination anxiety have consistently been associated with low academic performance and educational success (Cassady & Johnson, 2002; Seipp, 1991; Von der Embse et al., 2018).

Another important type of academic anxiety involves mathematics anxiety, which is defined as an individual's feelings of stress, tension, fear, and worry associated with performing numerical tasks and solving mathematical problems (Ashcraft & Kirk, 2001; Richardson & Suinn, 1972; Hembree, 1990; Dowker et al., 2016). This type of anxiety has a direct effect on cognitive functions, such as working memory, making individuals poorer performers in mathematics (Ashcraft & Ridley, 2005; Ashcraft & Krause, 2007; Ramirez et al., 2013). Research shows that students who experience higher levels of mathematics anxiety are prone to avoiding mathematics-based activities and studies (Hembree, 1990; Ma, 1999; Ashcraft, 2002; Beilock & Willingham, 2014).

Anxiety over language has likewise turned out to be a significant educational problem in institutions of learning where communication in a particular language becomes an essential part of learning and assessment processes (Horwitz et al., 1986; MacIntyre & Gardner, 1991; Young, 1991). This type of anxiety involves fear of communication, negative evaluation, and embarrassment in the course of language learning and interaction within the classroom (MacIntyre & Gardner, 1994; Horwitz, 2001; Dewaele & MacIntyre, 2014). Students who experience language anxiety tend to demonstrate non-involvement, lack of confidence in communication, and difficulties in language learning and academic performance (Horwitz et al., 2010).

Presentation anxiety and social anxiety are two common forms of anxiety suffered by university students due to increased participation in academic activities as well as performances before audiences. Presentation anxiety is characterized by fear and nervousness during presentations before people or in class, while social anxiety pertains to fear of possible criticism, embarrassment, and negative evaluations in social and interpersonal situations (Leary, 1983; Schlenker & Leary, 1982; Watson & Friend, 1969; Clark & Wells, 1995; Rapee & Heimberg, 1997). Both are consistently associated with avoidance behavior and impaired academic engagement (Beidel & Turner, 2007; Spence & Rapee, 2016).

In view of the rising cases of anxiety problems experienced by university students, there is a need for efficient methods that can determine major sources of study anxiety (Beiter et al., 2015; Stallman, 2010; Ibrahim et al., 2013). Psychological instruments of measurement aid in the identification of behavioral and emotional patterns related to academic performance and psychological well-being (Anastasi & Urbina, 1997; Groth-Marnat & Wright, 2016; Cohen & Swerdlik, 2018). There are several psychological tests used to measure academic and study anxiety problems; however, most of these tests primarily measure examination anxiety rather than broader dimensions of study anxiety (Zeidner, 1998; Spielberger & Vagg, 1995; Cassady, 2010).

Prima Vitasari and colleagues developed the Study Anxiety Sources Scale to assess various sources responsible for study anxiety experienced by university students. The scale contains forty items intended to measure different dimensions of academic anxiety such as examination anxiety, mathematics anxiety, language anxiety, presentation anxiety, and social anxiety (Vitasari et al., 2010; Putwain, 2007). This instrument was developed to assess general academic anxiety sources of university students and the use of this instrument in academic context is justified because of capturing the multiple dimensions of academic functioning and the psychological functioning of university students (Vitasari et al., 2010; Zeidner, 1998).

In recent times, with the use of psychological tools in various cultures, there has been a need for adaptation and validation processes in order to ensure conceptual and cultural equivalence of

measurement instruments, as demonstrated by Hambleton (2005), Van de Vijver and Tanzer (2004), Beaton et al. (2000) and Byrne (2008). Students' emotions and their concept of academic anxiety are strongly influenced by cultural beliefs, education systems and society's expectations (Triandis, 1995; Markus & Kitayama, 1991; Hofstede, 2001; Nisbett, 2003). Collectivist societies such as Pakistan have a stronger correlation between academic performance and parental goals and aspirations for the future (Kagiticbasi, 2007; Triandis, 2001).

Increasing focus has been paid to mental health issues among university students in Pakistan in recent years, however there are relatively few culturally relevant and psychometrically validated instruments for measuring academic anxiety. There are existing instruments to measure academic anxiety, but they were created in Western contexts and have been translated into other languages, which may diminish conceptual clarity and cultural appropriateness (Berry et al., 2011; Van de Vijver & Leung, 1997; Chen, 2008; Matsumoto & Juang, 2016).

In this context, translation and psychometric validation of instruments measuring study anxiety is necessary to ensure proper measurement of study anxiety experiences of students in Pakistan. The present study aims to psychometrically evaluate Study Anxiety Sources Scale in University students. Knowing the primary sources of study anxiety could help to develop a better understanding of students' learning problems. Furthermore, the outcomes can guide mental health providers, educators and educational researchers in designing specific interventions for students.

Aims and Objectives

The current study intended to accomplish the following objectives:

- To translate Study Anxiety Sources Scale into Urdu using Forward–backward translation procedure.
- To assess the psychometric characteristics of the Urdu version of Study Anxiety Sources Scale (SAS), such as factor structure, reliability and validity among the Pakistani university students.

Method

In the present study, translation and validation of the Study Anxiety Sources Scale was done among the university students of Pakistan. This research was conducted in two phase. During phase 1, the translation of the instrument was done while the Confirmatory Factor Analysis (CFA) of the instrument was conducted to assess its factorial validity during the second phase.

Phase I: Translation of the Study Anxiety Sources Scale

Instrument

In the present study, academic study related sources of anxiety were measured using Study Anxiety Sources Scale formulated by Prima Vitasari et al. Study Anxiety Sources Scale contained 40 items that measured various types of anxiety associated with academic activities including examination, class presentation, mathematics, language, and social anxiety. The measure evaluated the emotional, cognitive and behavioral reactions to stress experiences and problems experienced by students while learning. The basic psychometric qualities of the initial scale were adequate and the scale could be employed to examine the primary stressors of students in terms of psychological functioning and academic performance. It is based on previous studies that showed the relationship between level of study anxiety and academic achievement and emotional state of the university students is very significant. There was no Urdu version of the Study Anxiety Sources Scale available; therefore, the scale was translated for use among Pakistani university students.

Permission for translation was obtained, and the process was conducted according to cross-cultural standards proposed by Brislin (1970, 1976, 1980).

The translation procedure was carried out according to the following steps:

Step 1: Forward translation of the test tool into Urdu

In Step 1, experts bilingual in both English and Urdu languages translated the test into the target language while maintaining the original instrument's conceptual and semantic integrity.

Step 2: Evaluation by an expert committee

In Step 2, an expert committee comprising psychologists and linguists assessed the translation and selected the most appropriate wording. Modifications were carried out wherever necessary.

Step 3: Back-translation into English

In Step 3, the translation obtained in Step 2 was independently back-translated into English by experts who were blind to the original test form. The back-translation procedure ensured semantic accuracy.

Step 4: Final review and reconciliation using a committee technique

In Step 4, the original and back-translated forms were compared and refined accordingly. This was done to ensure conceptual integrity and semantic appropriateness of the final version of the translated test.

Step 5: Testing of the translated form

In Step 5, pilot study of the test was conducted among a sample of university students using convenience sampling. The sample was requested to provide feedback about any items they perceived as unclear or ambiguous. It emerged that the instrument's items were clear and culturally relevant for the target population. Pilot testing showed that the test took between 10–15 minutes to administer.

Phase II: Structural Validation Using Confirmatory Factor Analysis

The Study Anxiety Sources Scale, translated into Urdu, was administered to university students in Pakistan in order to examine its factorial validity and psychometric properties. It was expected that Confirmatory Factor Analysis (CFA) would help determine the congruence between the proposed factor structure and the actual data obtained from the survey.

In addition to model fit indices, other psychometric characteristics such as internal consistency, convergent validity, and discriminant validity were used as benchmarks to evaluate the reliability and validity of the Urdu scale for measuring academic anxiety. Based on the results of the study, it was expected that they would establish the reliability, validity and cultural appropriateness of the Urdu version of Study Anxiety Sources Scale.

Participants

In the current study, a total of 430 students from the University were selected using convenience sampling. Of these participants, 260 were males (60.5%) and 170 were females (39.5%). As for age distribution, there were 91.6% of the participants between 18-29 years old, and 7.7% aged 30-39 years, and 0.7% aged 40-50 years. This would mean that the majority of respondents were in the young adulthood category. When it comes to educational qualification, the sample included those who have matriculation degree (3.7%), intermediate (19.5%), undergraduate (62.6%),

graduate (11.9%) and postgraduate (2.3%). Thus, it may be concluded that the sample population was mainly university students and young adults.

Procedure

All the concerned authorities and Advanced Studies and Research Board (AS&RB) of the university were consulted for permission. The data were collected using a structured survey questionnaire created in Google Forms. The survey comprised three major sections. Informed consent included a brief description of the study, that this study was conducted on a volunteer basis, confidentiality and the right to withdraw at any time. A second section contained demographic data including age, gender and education level. The third section was the Urdu version of the Study Anxiety Sources Scale (SAS) designed to measure various components of university students' study anxiety. The survey link was distributed through social media (WhatsApp and SMS). A non-probability convenience sampling method was used for data collection. Responses were downloaded and statistically analysed using SPSS Version 23 after data collection.

Result

Table 1. Descriptive Statistics of Demographic Characteristics of Sample (N=430)

Variables		Frequency	Percentage
Gender	Male	260	60.5
	Female	170	39.5
Age	18-29	394	91.6
	30-39	33	7.7
	40-50	3	.7
Education	Matric	16	3.7
	Intermediate	84	19.5
	Undergraduate	269	62.6
	Graduate	51	11.9
	Post Graduate	10	2.3

The demographic characteristics of the participants, including Pakistani university students from various educational backgrounds, are detailed in Table 1.

Table 2. Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.878	40

Note: Cronbach's Alpha= α , N= Total Number of items

Reliability is concerned with how consistent, stable, and dependable a measurement device is in producing reliable and valid data. It measures the amount of random error contained in a test or measurement instrument (Cronbach, 1951; Nunnally & Bernstein, 1994). Cronbach's alpha is one of the commonly used measures of internal consistency reliability, in which the items of a scale measure the same variable being assessed (Sijtsma, 2009).

In this study, the reliability coefficient of the Study Anxiety Sources Scale was computed as .878 for 40 items, demonstrating a high degree of internal consistency. Reliability coefficients above .80 are generally regarded as indicators of good reliability based on established psychometric criteria (Nunnally & Bernstein, 1994). In this case, the reliability coefficient implies

a strong correlation among the items constituting the scale and therefore indicates good reliability of the scale.

Table 3. Item-total correlation of the Study Anxiety Sources Scale (N=430)

	Exam	Language	Math	Social	Presentation	Library
Exam	1	.431**	.302**	.371**	.283**	.273**
Language		1	.304**	.422**	.386**	.392**
Math			1	.431**	.309**	.326**
Social				1	.462**	.453**
Presentation					1	.443**
Library						1
M	20.50	15.27	15.23	36.13	14.65	18.97
SD	5.35	4.39	4.33	8.49	4.67	5.68

Descriptive statistics for the Study Anxiety Sources Scale are presented in Table 3 in terms of mean scores, standard deviations, and correlation coefficients among the items as derived from the responses of the participants in the current study.

Phase 2: Confirmation of Factor Structure and Assessing the Psychometric Properties of the Study Anxiety Sources Scale (N=403)

Confirmatory Factor Analysis (CFA)

The Confirmatory Factor Analysis (CFA) is a theory-based multivariate statistical method used to determine whether the collected data conform to a specified measurement model derived from theoretical assumptions regarding the relationships between observed indicators and underlying latent factors (Brown, 2015; Kline, 2016). Unlike Exploratory Factor Analysis (EFA), which seeks to identify latent structure in the data without prior hypotheses, CFA is used to test theoretically specified models that have already been proposed (Hair et al., 2019). Therefore, CFA is considered a necessary step in scale construction and psychometric validation studies.

One of the advantages of CFA is that it not only estimates factor loadings, but also estimates relationships between latent constructs and measurement error, resulting in an overall assessment of construct validity (Byrne, 2016). These factor loadings are standardized estimates which indicate to what extent an item represents the latent variable it measures and the variance which is not explained by the latent constructs are the measurement error terms. Furthermore, convergent and discriminant validity and construct validity are important indicators of model adequacy that can be assessed using CFA (Fornell & Larcker, 1981).

There are several indices that are generally used to evaluate the fit of a measurement model, such as Chi-square (χ^2), Chi-square/degrees of freedom ratio (CMIN/DF), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Incremental Fit Index (IFI), and Root Mean Square Error of Approximation (RMSEA) (Hu & Bentler, 1999; Kline, 2016). Based on the majority of authors, a CFI of .90 and above as well as TLI above .90 and IFI above .90 are regarded as acceptable, and RMSEA below .06 is considered acceptable (Brown, 2015; Byrne, 2016).

In the present study, Confirmatory Factor Analysis (CFA) was used to examine the factor structure of Study Anxiety Sources Scale in Urdu among University students in Pakistan. A convenience sampling was used to recruit 430 people for this purpose. This study assessed the psychometric properties of the instrument such as factorial, internal consistency, convergent validity, discriminant validity and construct reliability. In CFA, only a few error covariances were added when there was a theoretical basis for doing so, using the content and item similarity criterion.

The modifications were designed to enhance the fit of the model but they were used carefully to prevent overfitting and maintain the theoretical value of the model. All post-hoc changes were eliminated unless there was conceptual justification for their inclusion. When errors in some items are correlated due to similar wording and/or the overlapping content of the items, it is acceptable to do so in CFA (Byrne, 2016; Kline, 2016). Thus, in the current study, correlations between selected error terms were only performed if theoretically appropriate. The main intent behind adding such correlations is to make the model fit better while not changing the conceptual or structural structure of the model. The outcomes of the CFA confirmed the relevance and satisfactory structure of the Urdu translation of the study anxiety sources scale in the cultural context of Pakistan. Each factor loading was statistically significant with acceptable to high values, and thus all items were adequate in contributing to their latent construct. The figure below shows the model and standardized factor loadings.

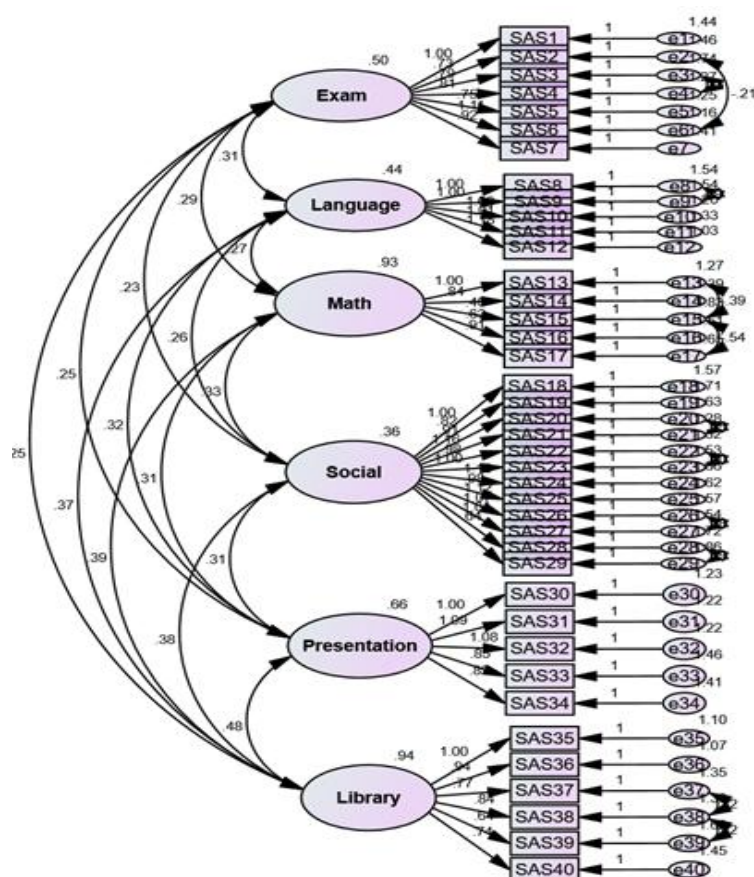


Figure 1: CFA Model of the Study Anxiety Sources Scale (N = 430)

Table 4. Confirmatory Factor Analysis of the Study Anxiety Sources Scale (N=430)

CMIN/DF	IFI	TLI	CFI	RMSEA
1.418	.905	.894	.903	.031

Note: IFI= Incremental Fit Indices, TLI= Tucker Lewis Index, CFI= Comparative Fit Indices, RMSEA= Root Mean Square Error of Approximation

Confirmatory Factor Analysis (CFA) was conducted to examine the factorial validity of the Urdu version of the Study Anxiety Sources Scale among Pakistani university students. The hypothesized six-factor model demonstrated an overall acceptable fit to the data.

Model fit indices suggested adequate model fit: $\chi^2/df = 1.418$, CFI = .903, IFI = .905, TLI = .894, and RMSEA = .031. The χ^2/df ratio and RMSEA indicated excellent absolute fit; CFI exceeded the recommended threshold of .90, indicating acceptable comparative fit. However, the TLI value (.894) fell slightly below the recommended cutoff, suggesting marginal limitations in model parsimony. Overall, the model demonstrated acceptable but not perfect fit, indicating that the proposed factorial structure is reasonably supported by the data.

Standardized factor loadings ranged from 0.46 to 1.00, indicating acceptable to strong item representation of their respective latent constructs. A total of 9 error co-variances were specified only between items within the same latent factors with conceptual overlap to improve model fit without compromising theoretical integrity.

Table 5. Descriptive Statistics of the Study Anxiety Sources Scale (N=430)

Variables	K	M(SD)	A
Exam Anxiety	7	20.50(5.35)	.658
Language Anxiety	5	15.27(4.39)	.665
Math Anxiety	5	15.23(4.33)	.548
Social Anxiety	12	36.13(8.49)	.735
Presentation Anxiety	5	14.65(4.67)	.696
Library Anxiety	6	18.97(5.68)	.758

Note: k = Number of items; M = Mean, SD = Standard Deviation, α = Cronbach's alpha

The findings reported in the table provide information on the reliability, means, and standard deviations of the Study Anxiety Sources Scale together with its respective subscales in the present sample population.

Table 6. The Psychometric Properties (AVE and Discriminant Validity) of the Study Anxiety Sources Scale-Urdu version

	CR	AVE	MSV	MaxR(H)	Exam	Language	Math	Social	Presentation	Library
Exam	0.658	0.219	0.445	0.670	0.468					
Language	0.645	0.268	0.445	0.652	0.667***	0.518				
Math	0.630	0.267	0.316	0.667	0.429***	0.425***	0.517			
Social	0.723	0.182	0.440	0.731	0.532***	0.663***	0.562***	0.426		
Presentation	0.702	0.322	0.405	0.710	0.444***	0.586***	0.398***	0.636***	0.568	
Library	0.741	0.328	0.427	0.757	0.371***	0.580***	0.412***	0.654***	0.609***	0.573

The construct reliability of the scale was acceptable across all dimensions, with composite reliability (CR) values ranging from .630 to .741. These values indicate satisfactory internal consistency for exploratory and scale adaptation research.

Average Variance Extracted (AVE) values ranged from .182 to .328, which are below the recommended threshold of .50, indicating limited convergent validity. This indicates that although the constructs are internally consistent, the proportion of variance captured by the latent variables is relatively low.

MSV values were comparable to or exceeded AVE values in several constructs, suggesting partial overlap among dimensions and partially supported discriminant validity. This reflects the conceptual proximity of academic anxiety dimensions, where different forms of anxiety are theoretically related rather than fully independent.

Overall, the scale demonstrates acceptable reliability and structural validity, but limited convergent and discriminant validity. Therefore, the instrument is suitable for research use but requires further refinement before being considered a fully established psychometric measure.

Discussion

The present study aimed to translate and validate the Study Anxiety Sources Scale (SASS) into Urdu among the university students of Pakistan. Results are also important to the psychometric literature as they offer empirical support for the factorial structure, reliability, and construct validity of a multidimensional measure of academic anxiety in a non-Western context. The present study agrees with the domain specific multidimensional approach to academic anxiety (Zeidner, 1998; Cassady, 2010; Vitasari et al., 2010) over the earlier study which primarily conceptualized academic anxiety as a unidimensional construct.

Study anxiety is a well-documented emotional construct, characterized as a combination of cognitive, affective and physiological reactions which occur in evaluation situations in school (Pekrun, 2006). Cognitive models also indicate that anxiety disrupts attentional control processes and functioning in working memory, which results in decreased performance under evaluative pressure (Eysenck et al., 2007). The present results were consistent with these theoretical frameworks and the CFA confirmed the hypothesis that study anxiety could be divided into six factors that represent different, but correlated, aspects of study anxiety.

The overall model fit was acceptable as shown in the CFA results. The χ^2/df ratio (1.418) and RMSEA (.031) showed excellent absolute fit and CFI (.903) and IFI (.905) showed acceptable comparative fit. The TLI, however, was slightly below the recommended value (.894) indicating slightly marginal problems in model parsimony. This is similar to the previous literature on structural equation modeling, which states that TLI is sometimes more cautious and more sensitive to the complexity of the model, especially in cases of multidimensional psychological scales (Marsh et al., 2004; Brown, 2015; Kline, 2016). As a whole, the fit indices suggest a satisfactory support for the proposed model, albeit not optimal in all aspects.

The reliability analysis showed very good internal consistency of the overall scale ($\alpha = .878$), which proves the psychometric stability of the scale for research purpose in Urdu. There was some variation, however, in subscale reliabilities ranging from relatively high for mathematics anxiety to relatively low for the other scales. This is similar to previous studies that indicated that mathematics anxiety is related to a variety of cognitive and educational issues, such as previous mathematical achievement, quality of math instruction, and individual differences in numerical cognition (Ashcraft & Kirk, 2001; Hembree, 1990; Ashcraft & Ridley, 2005). This variability is especially to be expected in the context of developing education where mathematical exposure and pedagogies are extremely diverse.

The pattern of the results with regard to construct validity was mixed. The composite reliability values (CR = .630–.741) revealed acceptable internal consistency for the latent construct level, whereas the Average Variance Extracted values (AVE = .182–.328) did not meet the proposed criterion of .50, which is considered acceptable convergent validity. This indicates that the constructs are internally consistent but that the variance explained by their indicators is not high enough to support a good convergent validity. This is a common phenomenon in multidimensional psychological tools, especially when adapting them across different cultures to ensure conceptual breadth and content validity (Fornell & Larcker, 1981; Hair et al., 2019).

The discriminant validity analysis also showed that there was a certain degree of overlap between constructs with MSV values that were similar to or higher than AVE in some dimensions. This indicates that dimensions are conceptually different but they are also empirically related to each other. This pattern has been theoretically aligned with hierarchical (Pekrun, 2006) and network-based (Borsboom, 2008; Putwain, 2007) models of academic emotions that suggest that academic anxiety domains share underlying affective (and also cognitive) mechanisms instead of being fully

independent constructs. Exam, presentation, and social evaluation anxiety are frequently co-occurring in academic situations because they share mechanisms of evaluative threat and performance pressure (Cassady, 2010; Zeidner, 1998).

Taking a cultural approach, the observed overlap between the anxiety dimensions could be attributed to the emphasis placed on family expectations, social comparisons and future occupational success in education, which are strongly linked to these dimensions in Pakistan (Kagitcibasi, 2007; Hofstede, 2001; Markus & Kitayama, 1991). In these settings, academic stressors may not occur in isolation, but in combination, which may be part of the reason for the inter-factor model correlations.

The descriptive results showed that participants' most salient dimension was social anxiety. This indicates that for the Pakistani University students, interpersonal evaluation, classroom participation and fear of negative evaluation are especially important stressors of academics. This is consistent with the literature which suggests that fear of negative evaluation is an integral component of social anxiety in a collectivistic and performance-oriented academic setting (Leary, 1983; Watson & Friend, 1969; Hofmann, 2007). Examination anxiety was another significant factor related to academic stress, as it has been a major source of academic stress and performance impairment in much of the research literature (Cassady & Johnson, 2002; Zeidner, 1998; Hembree, 1988).

The overall results confirm the multidimensional conception of study anxiety, as well as the interrelatedness of its aspects. This is similar to cross cultural validation of psychological instruments, for which structural validity is usually found to be superior to convergent and discriminant validity at early stages of adaptation (Van de Vijver & Leung, 1997; Byrne, 2008). This indicates that the factorial structure is more or less consistent, but further development at the item level may be necessary to further sharpen the measurement and minimise construct overlap.

The Urdu version of the Study Anxiety Sources Scale has shown acceptable reliability and factorial structure but its limitations in convergent and discriminant validity suggests that the scale is in a developing stage of psychometrics. Future research should direct attention to item refinement, conceptual reduction of redundancy between the items within dimensions, and other structural models, such as higher order or bifactor models to further elucidate the structure of study anxiety.

Limitations and Suggestions

A few limitations incurred during the study needs to be acknowledged.

- Convenience sampling was used in the study that might have affected the external validity and generalizability to broader Pakistani student populations. Future research should employ probability-based sampling methods to enhance representativeness (Creswell, 2014).
- The low AVE values and borderline discriminant validity was revealed during the study, suggesting that further scale refinement may be required before the instrument can be considered for diagnostic use.

Conclusion

The present study translated and validated the Urdu version of the Study Anxiety Sources Scale among Pakistani university students. The results support the conceptualization of study anxiety as a multidimensional construct composed of interrelated but distinct domains. The Urdu version of

the Study Anxiety Sources Scale demonstrated acceptable internal consistency and structural validity. However, low convergent validity and partially supported discriminant validity indicate overlap among several constructs.

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