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Psychological Flexibility for University Students: Scale Development Employing Exploratory and Confirmatory Factor Analyses

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The objective of the study was to develop and validate an instrument to measure psychological flexibility in university students. There has been a lack of relevant existing tools that provides the expressions from the local context of Pakistani culture among the study population. The data was collected from a private university in Lahore Pakistan. A pool of 43 items was generated with the help of 73 undergraduate students. The items were administered to (N=538) students, males (28%), and females (72%) with the mean age of 21.5 years, (SD=3.64). The responses were equally divided to perform exploratory factor analysis and confirmatory factor analysis. The results arrived at a five-factor solution of 42 items and a three-factor solution of 29 items. Among the two competing solutions, the three-factor model of 29 items was chosen as the final scale based on confirmatory factor analysis results which measures (a) compassion and moral values, (b) social adjustment, and (c) self-management in university students belong to the fields of natural, social or management sciences. The scale is named the "Psychological Flexibility Scale for University students (PFS-US)". This suggests that the tool would provide future directions for advancement in this area of assessment and prevention of mental health in university students.

Keywords: psychological flexibility; university students; exploratory factor analysis; confirmatory factor analysis

Exploration of the psychological flexibility structure as an independent factor has been caught significant attention in the last few years (Jenkins et al., 2019 ;Seidler et al., 2020). Many studies have performed trials to investigate the effectiveness in the management of emotional pain and stress (Wynne et al., 2019; Yuen et al., 2019) as a resilience factor (Gentili et al., 2019). To overcome the daily life stressors at an early age in youth, psychological flexibility may serve as a prerequisite for university students to prevent the development of chronic psychological symptoms in later life. High psychological flexibility predicts improved mental health (Turley et al., 2019) and boosts the effectiveness of the targeted intervention for behavior modification (Stockton et al., 2019). It may also anticipate better social relationships in university students (Zahra et al., 2020). Poor interpersonal relationships might result in addictive behaviors for example substance abuse (Buzdar et al., 2019) and emotional difficulties. Psychological flexibility may serve as one of the preventative factors (Baugh et al., 2019; Benoy et al., 2019). In short, psychological flexibility is a skill to achieve for the enhancement of health outcomes, personal growth, social interaction, and stress management (Hegarty et al., 2019). There is a need to develop a culturally appropriate (Ong et al., 2019) tool for intervention planning and monitoring of the results through the indigenous measuring tool for an individual's ability to

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adjust own thoughts, emotions, and actions based on the present situation (Benjamin et al., 2020).

Psychological flexibility is related to the self-management of distressful thoughts, emotions, and actions (Almarzooqi et al., 2017). The most well-known model of psychological flexibility has been advocating its efficacy in the promotion of mental health since proposed in the 1990s as a therapeutic intervention called acceptance and commitment therapy (Hayes et al., 2019). The approach to study this construct has claimed that psychological flexibility plays a buffering role in the development of mental illnesses. This improves the quality of life, reduces the impairment through mediating and moderating effects between the correlates of mental health and illnesses (Leonidou et al., 2019). The concept of psychological flexibility has been used in the assessment tools validated for the western population (Benoy et al., 2019 ;Ong et al., 2019) namely Psychological Flexibility Questionnaire (PFQ), Open and Engaged Questionnaire, Action and Acceptance Questionnaire II (AAQ-II) by Bond et al. (2011) that has been linked with the six dimensions discussed in the model including mindfulness, experiential avoidance, self as context, value-based committed action, etc. (Benoy et al., 2019; Timmers et al., 2019).

The literature review for the psychological flexibility leads to the understanding of the construct in terms of the "person by situation approach" in which cognitive and emotional reappraisal demands the adaptability of human behavior based on a present situation (Kobylińska & Kusev, 2019). It refers to managing and regulating the expression of psychological functioning in human beings that reflects in the activities. Negative and unpleasant thoughts or emotions have been associated with psychosomatic symptoms (Boykin et al., 2019), mood disruptions, anxiety, depression, and several other psychopathologies even psychological flexibility also has been shown that there is a potential to mediate the impact of psychedelic drugs on mental health and functioning (Davis et al., 2020). The trials containing the control group have been demonstrated that an increase in the tendency to manage own thoughts, emotions, and actions may exhibit different outcomes due to the influence of one's cultural, social, and environmental factors (Kioskli et al., 2019; Thompson et al., 2020).

The cross-cultural differences may be caused by genetic dispositions, external stimuli, and personal life experiences. Such differences in the expression and manifestation of psychological flexibility implied (Ramaci et al., 2019) for the addition of responses from Asian context in the emerging evidence for the application of the construct in a specific context as compared to the universal utility of the available scales (Timmers et al., 2019). As Pakistan has concerned, minimal literature about psychological flexibility has been contributed. In Pakistan, the researchers have been used the scales validated for the western population and the outcome of the studies (Ong et al., 2019) may fail to reveal the true expressions and manifestations of psychological flexibility due to the unique nature of culturally driven responses from the individuals belonging to a particular setting (Drake et al., 2019). It has also been strongly recommended that the measurement tool for psychological flexibility must be validated across cultures and specific populations (Ong et al., 2019). This area has been neglected in university students as well (Sutcliffe et al., 2019).

The challenge is to provide clinical and non-clinical professionals with an indigenous assessment tool to measure psychological flexibility (Richardson & Jost, 2019). There is a gap in the utility of psychological flexibility culturally specific interventions to train for the self-management of stress and related mental health issues specifically in young adults (McAteer & Gillanders, 2019). Issues including low self-esteem, suicidal ideation, and difficulty in interpersonal relationships (Bibi et al., 2020) have been reported in the recent literature since the

last decade as a result of psychological inflexibility in adults (Roush et al., 2019). The university students suffer from similar psychiatric problems along with poor academic performance, aggression, and hostility due to the lack of psychological flexibility (Berkout et al., 2019). Inflexibility in behavior leads to depression, quality of life, and an unproductive attitude towards the recovery of mental health conditions (Kim & Lee, 2019).

Rationale

The exploration of the nature of psychological flexibility (Barney et al., 2019) in the context of Pakistani culture is unaddressed (Lei et al., 2016). This will supply the demand for the development of indigenous psychological flexibility measuring tools (Žuljević et al., 2020) in more diverse contexts and specific evidence-based prevention intervention studies to plan suitable programs for university students in the future (Reilly et al., 2018). The characteristics of psychological flexibility have been explored in this study to develop and validate an indigenous scale for university students in Lahore, Pakistan.

In the light of the overall purpose for the study, the process included several phases (Carpenter, 2018) i.e. phenomenology and expert validation, reliability and validity check for the instrument development, exploratory and confirmatory factor analysis, instrument finalization. Throughout the process, guidelines provided for scale development by (DeVellis, 2012) were implemented that included the following eight steps:

- Operationalization of the variable
- Item pool generation
- Content validity index (CVI) and Likert scale for the measurement of responses
- Expert validation of the item pool
- Inclusion of validated items
- Administrating the items to the sample population
- Evaluating the items
- Optimizing the scale length
- To carry out the statistical procedures for this study, multiple comprehensive sources including published studies have been studied including those relevant to the construct i.e. cognitive, emotional, and behavioral ability (Meyer et al., 2019).

Method

Research Design

This study was a mixed-methods research design. The data was collected in both qualitative and quantitative forms and the responses were noted to assess the psychological flexibility with the help of valid and reliable questionnaires.

Sample

The participants (N=538) who showed agreement and voluntarily responded to the protocols were recruited as the sample for the testing. Twenty percent of the sample was attained after two weeks of interval for the test-retest reliability.

Assessment Measures

The demographic information including the age, gender, and field of study from the participants was recorded with the following measures:

Psychological Flexibility Scale for University Students (PFS-US)

This is the newly developed indigenous tool for measuring psychological flexibility in university students. The scale contained 43 expressions reported by the university students based on their experiences. The given instructions were "A list of statements is given. Considering how true each of the statements is for you, choose the relevant option for each of the statements to indicate your response!". The scoring options included (1) *never*, (2), *sometimes*, (3) *often*, (4) *always*. High scores represented high psychological flexibility. The scores were further divided into three categories of low, moderate, and high with the cutoff scores range of 29-58, 59-87, and 88-116 respectively. The same strategy was utilized to calculate each of the factor scores. The scores range for factor 1 (low=14-28, moderate=29-42, high=43-56), factor 2 (low=11-22, moderate=23-33, high=34-44), and factor 3 (low=4-8, moderate=9-12, high=13-16) are planned accordingly based on the model of psychological flexibility.

Action and Acceptance Questionnaire (AAQ-II)

This questionnaire was developed, validated, and revised as a multidimensional tool that measures both psychological flexibility and inflexibility (Bond et al., 2011; Ong et al., 2019). The scale was administered on the current study population to establish discriminant validity. It is a self-report measure of one factor containing seven items total that assessed based on the response options comprised of scores from 1-7 were (1) *never true*, (2), *very seldom true*, (3) *seldom true*, (4) *sometimes true*, (5) *frequently true*, (6), *almost always true*, (7) *always true*. The higher scores represent psychological inflexibility and lower scores show psychological flexibility. This means the higher the scores the, higher the inflexibility and vice versa. In this study, the measure is used to correlate the higher scores on action and acceptance questionnaire II that represents higher psychological inflexibility with the higher scores of indigenous psychological flexibility. As a result, a negative correlation shows the difference between the scales. The instructions were "Below is a list of statements. Please rate how true each of the statements is for you by using the scale below to fill in your choice". The questionnaire has sound psychometric properties with accessibility and has been used commonly in many previous studies for similar purposes.

Procedure

Institutional ethical committees approved this study; ethical considerations were followed where necessary. Officially the permission was taken from the institutes for data collection via signature on letter formally. The university authority permitted to collect data for the present study. The aim was briefed and it was assured that confidentiality and anonymity would be maintained. The participants were approached; informed consent was obtained from them verbally and the research purpose was briefed to them as well. They were informed that they have the right to withdraw from the study anytime and in that case, their shared information will be discarded immediately otherwise used for research purposes only.

Phase I

The operationalization of the construct was carried out with the literature review and definitions used in the previous models. Using a definition, an open-ended question was devised to explore the phenomenology and elicit the responses from 73 university students with at least 12 years of formal education completion, both male and female aged between 16-29 about the

characteristics of psychologically flexible individuals in phase I of item pool generation. The overlapping and ambiguous items were removed from the initially collated 55 items. Then a list of the final 43 items extracted through qualitative content analysis, a phenomenological approach was shared with the experts along with the operational definition.

Phase II

In phase II of expert validation and pilot testing, five mental health experts with a minimum of 2 years of experience in student counseling including clinical psychologists were approached based on the convenience sampling non-probability method. The items were converted into a four-point Likert scale where 1 denoted "Not at all relevant/clear", 2 indicated " somewhat relevant/clear", 3 indicated "very much relevant/clear" and 4 denoted "completely relevant/clear". The experts were asked to rate the items to the extent it reflects the variable based on their professional experience with the development population. They empirically reviewed the responses reported by the participants for relevancy and clarity. All the items with the acceptable item-level content validity index (I-CVI) of more than 0.5-1.0 and acceptable level of scale content validity index (S-CVI), attained through 80% agreement by all the experts on each item was used for pilot testing with five university students to check whether it is reader-friendly. No item was excluded following the rating of expert validation; in this way, the face and content validity of the scale was achieved successfully. In pilot testing total administration time was an average of 10 minutes, no difficulty was reported in the understanding of instructions and scale items. Finally, the scale of 43 items was converted into a self-report measure for university students with language appropriateness for the specific culture in the English version based on the education level (Psychological Flexibility Scale for University Students PFS-US).

Phase III

Next, in phase III for the establishment of psychometric properties, the reader's friendly version of the items was used to collect data from (N=538) students from a private university in Lahore, males (28%) and females (72%) with a mean age (M=21.5, SD=3.64). Those students who have completed their 12 years of formal education currently enrolled in undergraduate degrees took part excluding those who participated in phases II and I. There were university students from natural sciences (38%), social sciences (39%), and management sciences (23%).

Results

Chronbach's Alpha Coefficient Reliability

For the construction of the PFS-US scale, an assessment of its reliability was analyzed. PFS-US had a significantly high inter-item correlation (α= .919) of the 43 items in the scale.

Split Half Reliability

The split-half reliability of the 29 finalized items was calculated with the odd and even method in which the items were divided into two halves containing 14 and 15 items. Between the two halves of the scale, the internal consistency of PFS-US was found .875 (p<0.001) and .798 (p<0.001) respectively. This presented a high correlation between the two halves of the scale items that was r= .801 (p<0.001).

Discriminant Validity

To establish construct validity, another scale to measure psychological inflexibility was administered to the participants. Results, r= -.174 (p<.05) highlighted that the two measures are negative weak relation to each other. The psychological flexibility scale has a negative weak correlation with another scale that measures psychological inflexibility.

Test-retest Reliability

Two weeks of test-retest reliability of the scale was derived on approximately 20% of the participants showing r= 0.975 (n=116, p<.001).

Reliability of the Factor Solutions

Chronbach's alpha of the 5 factors solution of the PFS-US scale is (α= .70) and for 3 factors is (α= .895). There is a significantly high correlation between the factors of the scale.

Exploratory Factor Analysis

The factor analysis was carried out to determine the factor structure of the PFS-US. The principal Component Analysis extraction method for parallel analysis was used. Varimax rotation of eigenvalues identified the underlying factors of the 43 items. The outcome highlighted the number of factors to retain in a factor analysis through the Monte Carlo simulation method. Kaiser-Meyer Olkin Measure of Sample Adequacy (KEMO) was found to be .912 and Bartlett's Test Approx. Chi-Square was 6550.29 (p<0.001) indicated that the distribution of data is appropriate for the factor analysis.

To establish the dimensions of PFS-US, all the possible variances are quickly and accurately calculated among various aspects. Then the initial eigenvalues of the components explained the factor loadings with ten, five, and three-factor solutions. After the satisfactory analysis was carried out, a five-factor solution was retained for the 42 items that provided a clear structure with about 24% variance of the data given below (Table.1). In this way, only one item was excluded.

Table 1

The Factor Structure, Five Factors Solution Loadings for the 42 items of PFS-US with Varimax Rotation Through Principal Component Analysis Extraction Method

Sr. No.	Item No.	F1	F2	F3	F4	F5
1	38	.64				
2	32	.58				
3	18	.56				
4	12	.54				
5	5	.53				
6	14	.53				
7	40	.48	.38			
8	23	.47				
9	4	.45				
10	8	.44			.39	
11	42	.44		.41		
12	9	.41		.33		
13	20	.39	.38			
14	2	.37				
15	19	.36	.30			
16	13	.35				
17	39		.71			
18	41		.64			
19	33		.54			
20	37		.51			
21	24		.50			
22	34		.49	.38		
23	25		.48			
24	10		.47			
25	11		.46		.41	
26	36		.43			
27	35		.43			
28	22		.41	.34	.39	
29	29			.64		
30	31			.62		
31	30			.62		
32	28			.58		
33	16			.48		.36
34	27			.40	.34	.36
35	43			.36		
36	6				.61	
37	7				.55	
38	15				.45	.36
39	1				.43	
40	3					.50
41	17		.34			.47
42	26	.38				.45

Note. Only the retained items are shown with the factor loadings of .30 and above. Among the dubious loadings, boldfaced are retained.

An alternative three-factor structure with less dubious and overlapped themes was also considered with a 26% variance as shown (in Table.2). However, following the results of CFA confirmed and verified the latent variables, 14 items were removed from the final scale.

Table 2

The Factor Structure, Three Factors Solution Loadings for the finalized 29 items of PFS-US with Varimax Rotation Through Principal Component Analysis Extraction Method

Sr. No.	Item No.	F1	F2	F3
1	30	.70		
2	41	.63		
3	29	.62		
4	22	.60		
5	31	.59		
6	34	.56		
7	27	.55		
8	39	.55		
9	28	.53		
10	36	.51		
11	25	.51		
12	33	.46		
13	43	.45		
14	24	.42		
15	38		.69	
16	32		.62	
17	14		.58	
18	18		.57	
19	12		.55	
20	5		.52	
21	23		.51	
22	40		.51	
23	4		.51	
24	9		.46	
25	19		.42	
26	15			.60
27	6			.59
28	7			.58
29	3			.51

Note: Only the retained items are shown with the factor loadings of .30 and above. Among the dubious loadings, boldfaced are retained.

Confirmatory Factor Analysis

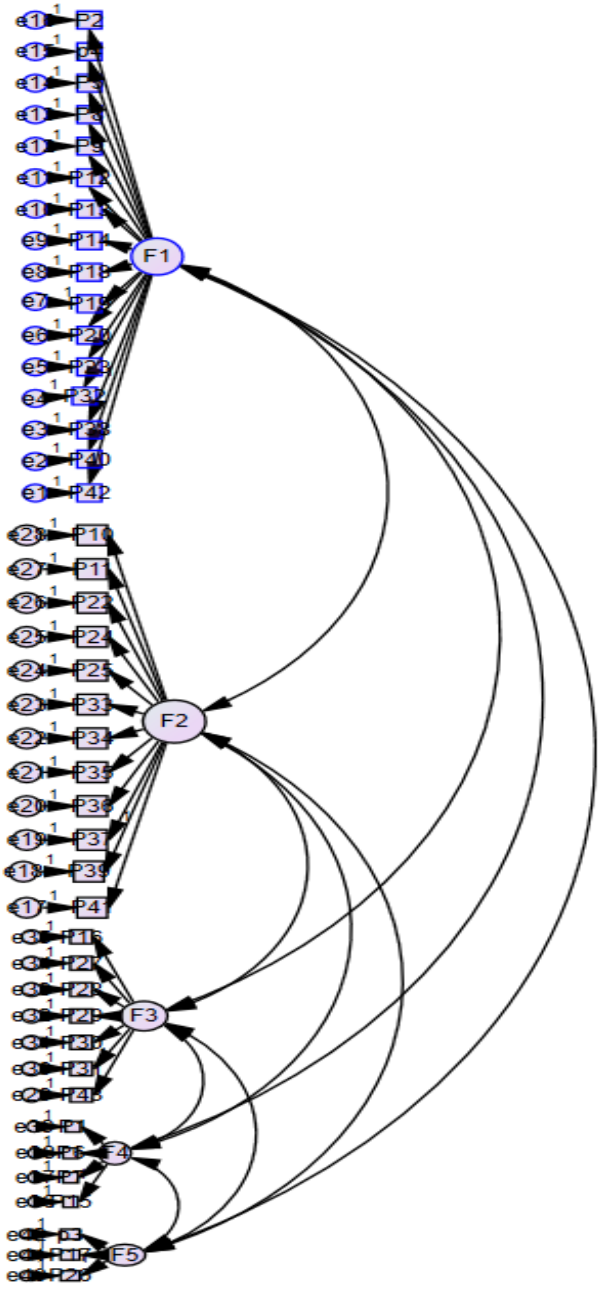
CFA was conducted to test the EFA results derived from the multidimensional construct of psychological flexibility. It is composed of five and three factors. A new data set was collected other than used for EFA of 269 undergraduate university students to analyze data in SPSS and AMOS v. 25. The same measures were administered and findings were examined.

A best-fit model (as shown in Figure 1) was found for Psychological Flexibility Scale for University Students (PFS-US) with the use of this statistical analysis technique that verifies the

factor structure of a set of observed variables. The analysis allows the researcher to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists. The researcher uses knowledge of the theory, empirical research, or both, that postulates the relationship pattern a priori and then tests the hypothesis statistically {Chyung, 2017 #636}. The purpose of using this method is to test for factorial invariance using Structural Equation Modeling (SEM), providing a comprehensive approach to evaluate differences between samples of participants, beginning from a confirmatory baseline model and subsequently adding constraints at the different measurement model (Iliceto & Fino, 2015).

Figure 1

Model Fit Indices of Psychological Flexibility Scale for University Students (PFS-US)

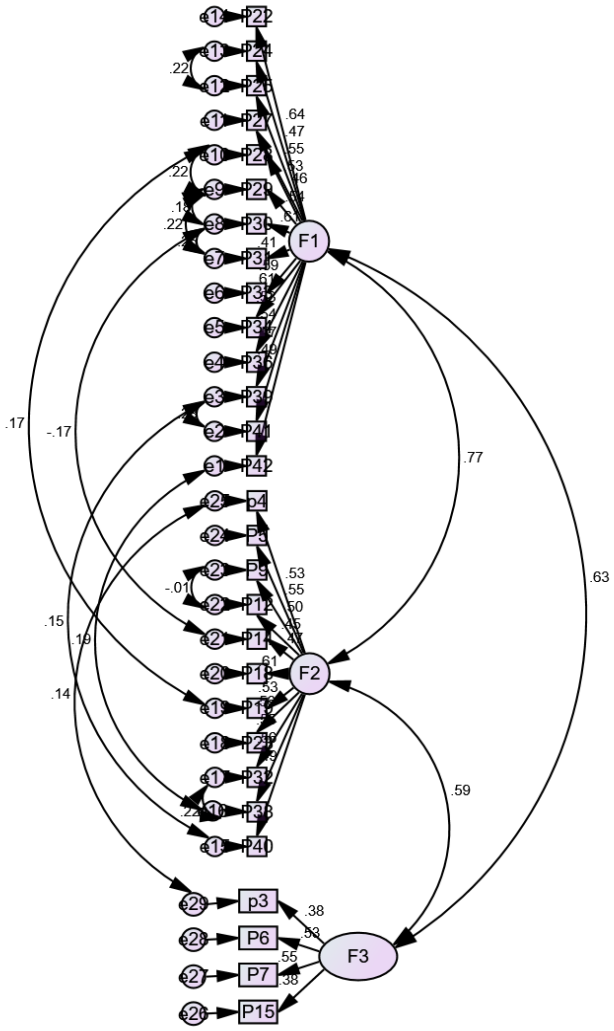


Note: Fourteen observed variables were excluded during this process.

It contains a powerful blueprint that identifies the factor structure or what we think it is. Some points to consider are as follows-Considering a research hypothesis being testing and sufficient sample size (e.g., 5-20 cases per parameter estimate), validating measurement instruments, Multivariate normality, and parameter identification (André et al., 2020).

Figure 2

Estimate parameters in the model of PFS-US



Note: The model shows three latent variables with their observed variles

The suggested approach to CFA proceeds through the following prabocess of steps (Worthington & Whittaker, 2006).

- Review the relevant theory and research literature to support model specification
- Specify a model (e.g., diagram, equations) and Determine model identification
- Collect data and Conduct preliminary descriptive statistical analysis, missing or outliers

- Estimate parameters in the model (as shown in Figure 2)
- Assess model fit and present or interpret the results

The ratio of each parameter estimate to its standard error is distributed as a z statistic and is significant at the level of 0.05 if its value exceeds 1.96 and at 0.01, its value exceeds 2.56. The model summary of this test for PFS-US is given below (as shown in Table.3).

Table 3
The model summary of PFS-US

χ^2	df	χ^2 /df	RMSEA	TLI	RMR	CFI
		<3	<.06		<.08	>0.95
737.899	364	2.027	.044	.894	.037	0.905

Note: Fit statistics for the second model were $\chi 2$ (df = 2.02, n = 269) = 364, p < .001, CFI = .905, TLI = .894, RMSEA = .044 (90% confidence interval)

CFA is based on linear statistical models. Statistical tests associated are valid if certain assumptions are met assuming a normal distribution. It also incorporates measured variables and latent constructs. Results from these models indicated adequate fit (Mazzurco et al., 2020) for each of the factors (e.g., CFI > .931, TFI > .920) and all factor loadings are significant.

Discussion

The study was intended to develop and validate the indigenous psychological flexibility scale for university students, which would identify the culture-specific patterns of reaction in different situations using psychological flexibility. An open-ended approach through a response scale was used to explore the related expressions. Along with the PFS-US, the action and acceptance questionnaire II (Bond et al., 2011) was used. Exploratory factor analysis produced two-factor solutions with five and three factors. The confirmatory factor analysis led to the exclusion of a total of 14 items from the initial scale. Each of the factors in PFS-US was labeled based on the common emergent themes of the items within a factor. They retained 29 items that were assigned to their respective factors excluding the items that were not retained based on the test criteria. As an outcome, a scale with remaining items coherent with the EFA's three-factor solution with high reliability and validity was finalized.

It has been observed that psychological flexibility is functionally related to the different dimensions including compassion, moral values, social adjustment, and self-management. Some variations existed between cultures in the manifestation and expressions of psychological flexibility. From culture to culture, the differences between individualistic (Grégoire et al., 2020; Lucas et al., 2020) and collectivistic context supported the responses given by the development population for the scale. The students during university years of life go through certain biological changes and experience psychological distress (Morton et al., 2020) due to a variety of reasons i.e. social pressure, peer comparison, academic workload, career planning, identity formation, and so on. Such problems invite cognitive, behavioral (Upton, 2020), and emotional distress. The level of psychological flexibility affects stress management leading to the worsening of self-harming and fatal consequences (Kirtley, 2020).

Psychological flexibility is necessary to manage stress and to prevent the development of serious mental illness (Marais et al., 2020). They experience challenges frequently and face the

transitions for successful adjustment in different unpredictable situations (Peltz et al., 2020). For the assessment of their capacity to deal with the constant challenges, an indigenous scale was important to develop and test considering the cross-cultural differences (Koppenborg, 2020). The three factors were attained through EFA namely compassion and moral values, social adjustment, and self-management. The final factors are interpreted as follows:

Factor 1: Compassion and Moral Values

This factor contains 14 items. The items indicate acts of appreciation, forgiveness, respectfulness, guidance, and helpful attitude. The examples of the items in factor 1 are "faithful in social relationships", "care about the health of others", "motivated" and "Believe in spending quality time with others" and so on. The factor items have a resemblance with the values and committed action concept of the western psychological flexibility model (Fonseca et al., 2020; Miller & Orsillo, 2020). The items reflect the human nature of altruism in individuals which may be a hallmark of a collectivistic culture where providing social support and holding onto unlimited faith is expected and preferred for healthy functioning, success, and well-being (Akbar & Woods, 2020).

Factor 2: Social Adjustment

This factor contains 11 items. The items reveal effective communication, positive thinking, acceptance, focus on the present moment, and assertiveness. The examples of the items reflected in this factor are "listen attentively", "confident", "clarity about life purpose" and "able to handle any kind of conditions in life", and so on. The factor items are similar to the self-as context concept of the western psychological flexibility model (Zucchelli et al., 2020). The items of this factor and the literature suggest that human beings tend to interact in a socially satisfying manner when individuals are good at adjusting to the constant change in circumstances on daily basis (Tariq & Adil, 2020).

Factor 3: Self-Management

This factor contains 4 items. The items indicate situational behavior changes, self-awareness, and patience. The examples are “analyzing thoughts” and “observing emotions” etc so the items correlate with the present moment concept of the western psychological flexibility model (Ryan et al., 2020; Trindade et al., 2020). The items in this dimension show cultural variations. Self-control may change over time, observing their thoughts and emotions is accompanied by acknowledging others and context-based actions in the scale from collectivistic culture. This expresses that concepts are personal and do not universally rely on theories. In the specific culture of Pakistan, individuals mostly care about others than themselves even if not encouraged and regardless of the social support they seek (Shujja et al., 2020; Morton et al., 2020).

The first, second, and third factors are closely related to some of the factors suggested by the model of psychological flexibility in the western population. A couple of factors are also irrelevant to the indigenous scale and may be presented as typically unique for utility in the specific populations (Sairanen et al., 2020) other than eastern countries. For example, the present moment and acceptance factor (Ryan et al., 2020) from the European scale are somewhat related to factor 3 (self-management) in the newly developed indigenous Eastern scale while the values, committed action, self as context (Luoma et al., 2020) is slightly related to the factors 1 (compassion and moral value) and 2 (social adjustment). The dimension of cognitive defusion

(Zucchelli et al., 2020) that exists on the western scale is completely not expressed in the specific context of Pakistan.

Limitations, Recommendations, and Suggestions

The study was time-sensitive and limited to represent data from one setting. This recommended that psychological flexibility tools have importance for future research. Another recommendation is that the variable must be explored for advancement in counseling or clinical settings. This suggests that instruments be tested for a variety of purposes in the specific culture among diverse units of population.

Implications

The findings suggested that the indigenous scale has the implication that fulfills the gap of the need for a culturally appropriate tool that measures psychological flexibility. The application includes use in future research and institutions specifically dealing with the university population.

Conclusion

In the present study, a reliable and valid tool development was attempted to measure psychological flexibility in the local university students. Cultural-specific experiences were collated within this population. The results provided a final scale of 29 items with an acceptable level of psychometric properties. The goal of developing a scale with cultural implications for university students is achieved.

References

Akbar, S., & Woods, K. (2020). Understanding Pakistani parents' experience of having a child with special educational needs and disability (SEND) in England. *European Journal of Special Needs Education*, *35*(5), 663–678. https://doi.org/10.1080/08856257.2020.1748428

Almarzooqi, S., Chilcot, J., & McCracken, L. M. (2017). The role of psychological flexibility in migraine headache impact and depression. *Journal of Contextual Behavioral Science, 6*(2), 239-243. https://doi.org/10.1016/j.jcbs.2017.04.004

André, S., Maulana, R., Helms-Lorenz, M., Telli, S., Chun, S., Fernández-García, C.-M., de Jager, T., Irnidayanti, Y., Inda-Caro, M., Lee, O., Safrina, R., Coetzee, T., & Jeon, M. (2020). Student Perceptions in Measuring Teaching Behavior Across Six Countries: A Multi-Group Confirmatory Factor Analysis Approach to Measurement Invariance. *Frontiers in Psychology*, *11*, 273–285. https://doi.org/10.3389/fpsyg.2020.00273

Baugh, L. M., Cox, D. W., Young, R. A., & Kealy, D. (2019). Partner trust and childhood emotional maltreatment: The mediating and moderating roles of maladaptive schemas and psychological flexibility. *Journal of Contextual Behavioral Science*, *12*, 66–73. https://doi.org/10.1016/j.jcbs.2019.02.001

Benjamin, J. Z., Harbeck-Weber, C., Ale, C., & Sim, L. (2020). Becoming flexible: Increase in parent psychological flexibility uniquely predicts better well-being following participation in a pediatric interdisciplinary pain rehabilitation program. *Journal of Contextual Behavioral Science*, *15*, 181–188. https://doi.org/10.1016/j.jcbs.2020.01.003

Benoy, C., Knitter, B., Knellwolf, L., Doering, S., Klotsche, J., & Gloster, A. T. (2019). Assessing psychological flexibility: Validation of the open and engaged state questionnaire. *Journal of Contextual Behavioral Science, 12*, 253-260. https://doi.org/10.1016/j.jcbs.2018.08.005

Benoy, C., Knitter, B., Schumann, I., Bader, K., Walter, M., & Gloster, A. T. (2019). Treatment sensitivity: Its importance in the measurement of psychological flexibility. *Journal of Contextual Behavioral Science, 13*, 121-125. https://doi.org/10.1016/j.jcbs.2019.07.005

Berkout, O. V., Tinsley, D., & Flynn, M. K. (2019). A review of anger, hostility, and aggression from an ACT perspective. *Journal of Contextual Behavioral Science, 11*, 34-43. https://doi.org/10.1016/j.jcbs.2018.12.001

Bibi, A., Saleem, A., Khalid, M. A., & Shafique, N. (2020). Emotional Intelligence and Aggression among University Students of Pakistan: A Correlational Study. *Journal of Aggression, Maltreatment & Trauma*, *29*(10), 1189–1203. https://doi.org/10.1080/10926771.2019.1709592

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., . . . Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy, 42*(4), 676-688. https://doi.org/10.1016/j.beth.2011.03.007

Boykin, D. M., Anyanwu, J., Calvin, K., & Orcutt, H. K. (2020). The moderating effect of psychological flexibility on event centrality in determining trauma outcomes. *Psychological Trauma: Theory, Research, Practice, and Policy*, *12*(2), 193–199. https://doi.org/10.1037/tra0000490

Buzdar, M. A., Nadeem, M., Fatima, T., & Naoreen, B. (2019). Effects of Religious Orientations on the Prevalence of Social Media Disorder Among Muslim University Students in Pakistan. *Journal of Religion and Health*, *59*(6), 3247–3256. https://doi.org/10.1007/s10943-019-00915-6

Carpenter, S. (2018). Ten steps in scale development and reporting: A guide for researchers. *Communication Methods and Measures, 12*(1), 25-44. https://doi.org/10.1080/19312458.2017.1396583

Chyung, S. Y. Y., Winiecki, D. J., Hunt, G., & Sevier, C. M. (2017). Measuring learners' attitudes toward team projects: scale development through exploratory and confirmatory factor analyses. *American Journal of Engineering Education (AJEE), 8*(2), 61-82. https://doi.org/10.19030/ajee.v8i2.10065

Davis, A. K., Barrett, F. S., & Griffiths, R. R. (2020). Psychological flexibility mediates the relations between acute psychedelic effects and subjective decreases in depression and anxiety. *Journal of Contextual Behavioral Science, 15*, 39-45. https://doi.org/10.1016/j.jcbs.2019.11.004

DeVellis, R. F. (2012). Chapter 6: Factor Analysis. *Scale development: Theory and applications, 26*. Sage Publications, Inc.

Drake, C. E., Masuda, A., Dalsky, D., Stevens, K. T., Kramer, S., Primeaux, S. J., Muto, T., & Mitamura, T. (2018). Examining U.S. and Japanese College Students' Differences in Psychological Distress: the Mediating Roles of Valued Action and Experiential Avoidance. *International Journal for the Advancement of Counselling*, *41*(1), 25–40. https://doi.org/10.1007/s10447-018-9342-2

Fonseca, S., Trindade, I. A., Mendes, A. L., & Ferreira, C. (2020). The buffering role of psychological flexibility against the impact of major life events on depression symptoms. *Clinical Psychologist, 24*(1), 82-90. https://doi.org/10.1111/cp.12194

Gentili, C., Rickardsson, J., Zetterqvist, V., Simons, L., Lekander, M., & Wicksell, R. K. (2019). Psychological flexibility as a resilience factor in individuals with chronic pain. *Frontiers in Psychology, 10*. https://doi.org/0.3389/fpsyg.2019.02016

Grégoire, S., Chénier, C., Doucerain, M., Lachance, L., & Shankland, R. (2020). Ecological momentary assessment of stress, well-being, and psychological flexibility among college and university students during acceptance and commitment therapy. *Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement, 52*(3), 231-243. https://doi.org/10.1037/cbs0000175

Hayes, S. C., Law, S., Malady, M., Zhu, Z., & Bai, X. (2019). The centrality of sense of self in psychological flexibility processes: what the neurobiological and psychological correlates of psychedelics suggest. *Journal of Contextual Behavioral Science, 15*, 30-38. https://doi.org/10.1016/j.jcbs.2019.11.005

Hegarty, R. S. M., Treharne, G. J., Stebbings, S., Graham, K., & Conner, T. S. (2019). Optimising daily diary questionnaires about fatigue, psychological flexibility and well-being: perspectives of people with rheumatic disease. *Psychology & Health, 34*(2), 181-199. https://doi.org/10.1080/08870446.2018.1520232

Jenkins, M., Hargreaves, E. A., & Hodge, K. (2019). The role of psychological flexibility in physical activity maintenance. *Journal of Sport and Exercise Psychology, 1*, 1-9. https://doi.org/10.1123/jsep.2018-0311

Kim, I. S., & Lee, J. W. (2019). Effects of acceptance commitment therapy based recovery enhancement program on psychological flexibility, recovery attitude, and quality of life for inpatients with mental illness. *Journal of Korean Academy of Psychiatric and Mental Health Nursing, 28*(1), 79-90. https://doi.org/10.12934/jkpmhn.2019.28.1.79

Kioskli, K., Winkley, K., & McCracken, L. M. (2019). Might psychological flexibility processes and Acceptance and Commitment Therapy (ACT) apply in adults with painful diabetic neuropathy? A cross-sectional survey. *Journal of Contextual Behavioral Science, 13,* 66-73. https://doi.org/10.1016/j.jcbs.2019.07.002

Kirtley, O. J., Rodham, K., & Crane, C. (2020). Understanding suicidal ideation and behaviour in individuals with chronic pain: a review of the role of novel transdiagnostic psychological factors. *The Lancet Psychiatry, 7*(3), 282-290. https://doi.org/10.1016/S2215-0366(19)30288-*3*

Kobylińska, D., & Kusev, P. (2019). Flexible emotion regulation: How situational demands and individual differences influence the effectiveness of regulatory strategies. *Frontiers in Psychology, 10,* 72. https://doi.org/10.3389/fpsyg.2019.00072

Koppenborg, K. A. (2020). *Academic stress and mental health in international university students: the role of mindfulness, self-compassion and psychological flexibility.* [Unpublished master's thesis]. Institute of Psychology, Universiteit Leiden.

Leonidou, C., Panayiotou, G., Bati, A., & Karekla, M. (2019). Coping with psychosomatic symptoms: The buffering role of psychological flexibility and impact on quality of life. *Journal of Health Psychology, 24*(2), 175-187. https://doi.org/10.1177/1359105316666657

Lucas, J. J., & Moore, K. A. (2020). Psychological flexibility: positive implications for mental health and life satisfaction. *Health promotion international, 35*(2), 312-320. https://doi.org/10.1093/heapro/daz036

Luoma, J. B., Davis, A. K., Watts, R., & McCracken, L. M. (2020). Integrating contextual behavioral science with research on psychedelic assisted therapy: Introduction to the special section: Elsevier. https://doi.org/10.1016/j.jcbs.2020.01.004

Marais, G. A. B., Lantheaume, S., Fiault, R., & Shankland, R. (2020). Mindfulness-Based Programs Improve Psychological Flexibility, Mental Health, Well-Being, and Time Management in Academics. *European Journal of Investigation in Health, Psychology and Education, 10*(4), 1035–1050. https://doi.org/10.3390/ejihpe10040073

Mazzurco, A., Jesiek, B. K., & Godwin, A. (2020). Development of global engineering competency scale: exploratory and confirmatory factor analysis. *Journal of Civil Engineering Education, 146*(2), 04019003. https://doi.org/10.1061/(ASCE)EI.2643-9115.0000006

McAteer, G., & Gillanders, D. (2019). Investigating the role of psychological flexibility, masculine self-esteem and stoicism as predictors of psychological distress and quality of life in men living with prostate cancer. *European journal of cancer care, 28*(4), e13097. https://doi.org/10.1111/ecc.13097

Meyer, E. C., Szabo, Y. Z., Frankfurt, S. B., Kimbrel, N. A., DeBeer, B. B., & Morissette, S. B. (2019). Predictors of recovery from post-deployment posttraumatic stress disorder symptoms in war veterans: The contributions of psychological flexibility, mindfulness, and self-compassion. *Behaviour Research and Therapy, 114*, 7-14. https://doi.org/10.1016/j.brat.2019.01.002

Miller, A. N., & Orsillo, S. M. (2020). Values, acceptance, and belongingess in graduate school: Perspectives from underrepresented minority students. *Journal of Contextual Behavioral Science, 15*, 197-206. https://doi.org/1 0.1016/j.jcbs.2020.01.002

Morton, C., Mooney, T. A., Lozano, L. L., Adams, E. A., Makriyianis, H. M., & Liss, M. (2020). Psychological inflexibility moderates the relationship between thin-ideal internalization and disordered eating. *Eating Behaviors, 36,* 101345. https://doi.org/10.1016/j.eatbeh.2019.101345

Ong, C. W., Lee, E. B., Levin, M. E., & Twohig, M. P. (2019). A review of AAQ variants and other context-specific measures of psychological flexibility. *Journal of Contextual Behavioral Science, 12*, 329-346. https://doi.org/10.1016/j.jcbs.2019.02.007

Peltz, J. S., Rogge, R. D., Bodenlos, J. S., Kingery, J. N., & Pigeon, W. R. (2020). Changes in psychological inflexibility as a potential mediator of longitudinal links between college students' sleep problems and depressive symptoms. *Journal of Contextual Behavioral Science, 15*, 110-122. https://doi.org/10.1016/j.jcbs.2019.12.003

Ramaci, T., Bellini, D., Presti, G., & Santisi, G. (2019). Psychological flexibility and mindfulness as predictors of individual outcomes in hospital health workers. *Frontiers in psychology, 10,* 1302. https://doi.org/10.3389/fpsyg.2019.01302

Richardson, C. M. E., & Jost, S. A. (2019). Psychological flexibility as a mediator of the association between early life trauma and psychological symptoms. *Personality and Individual Differences, 141*, 101-106. https://doi.org/ 10.1016/j.paid.2018.12.029

Roush, J. F., Brown, S. L., Mitchell, S. M., & Cukrowicz, K. C. (2019). Experiential avoidance, cognitive fusion, and suicide ideation among psychiatric inpatients: The role of thwarted interpersonal needs. *Psychotherapy Research, 29*(4), 514-523. https://doi.org/10.1080/10503307.2017.1395923

Ryan, A. K., Pakenham, K. I., & Burton, N. W. (2020). A pilot evaluation of a group acceptance and commitment therapy-informed resilience training program for people with diabetes. *Australian Psychologist, 55*(3), 196-207. https://doi.org/10.1111/ap.12429

Sairanen, E., Lappalainen, R., Lappalainen, P., & Hiltunen, A. (2020). Mediators of change in online acceptance and commitment therapy for psychological symptoms of parents of children with chronic conditions: An investigation of change processes. *Journal of Contextual Behavioral Science, 15*. https://doi.org/10.1016/j.jcbs.2019.11.010

Seidler, D., Stone, B., Clark, B. E., Koran, J., & Drake, C. E. (2020). Evaluating the factor structure of the Multidimensional Psychological Flexibility Inventory: An independent replication and extension. *Journal of Contextual Behavioral Science*. https://contextualscience.org/article/evaluating_the_factor_structure_of_the_multidimensional_psychological_flexi

Shujja, S., Akram, A., Holzapfel, J., & Randall, A. K. (2020). Perceived ex-husband rejection and psychological distress among pakistani remarried women following divorce: Does emotional intelligence moderate? *Current Psychology*, 1-12. https://doi.org/10.1007/s12144-019-00601-6

Stockton, D., Kellett, S., Berrios, R., Sirois, F., Wilkinson, N., & Miles, G. (2019). Identifying the underlying mechanisms of change during acceptance and commitment therapy (ACT): A systematic review of contemporary mediation studies. *Behavioural and cognitive psychotherapy*, *47*(3), 332-362. https://doi.org/ 10.1017/S1352465818000553

Sutcliffe, K. R., Sedley, B., Hunt, M. J., & Macaskill, A. C. (2019). Relationships among academic procrastination, psychological flexibility, and delay discounting. *Behavior Analysis: Research and Practice, 19*(4), 315. https://doi.org/ 10.1037/bar0000145

Tariq, S., & Adil, A. (2020). Rigidity as mediator between temperaments and social adjustment: A comparative study of teachers of madaris and schools of Pakistan. *Archive for the Psychology of Religion*. https://doi.org/ 10.1177/*0084672420921956*

Thompson, B. L., Twohig, M. P., & Luoma, J. B. (2020). Psychological Flexibility as Shared Process of Change in Acceptance and Commitment Therapy and Exposure and Response Prevention for Obsessive-Compulsive Disorder: A Single Case Design Study. *Behavior Therapy*, *52*(2), 286–297. https://doi.org/10.1016/j.beth.2020.04.011

Timmers, I., Simons, L. E., Hernandez, J. M., McCracken, L. M., & Wallace, D. P. (2019). Parent psychological flexibility in the context of pediatric pain: Brief assessment and associations with parent behaviour and child functioning. *European Journal of Pain, 23*(7), 1340-1350. https://doi.org/10.1002/ejp.1403

Trindade, I. A., Mendes, A. L., & Ferreira, N. B. (2020). The moderating effect of psychological flexibility on the link between learned helplessness and depression symptomatology: A preliminary study. *Journal of Contextual Behavioral Science, 15*, 68-72. https://doi.org/10.1016/j.jcbs.2019.12.001

Turley, J., Lewis, C. A., Musharraf, S., Malik, J. A., & Breslin, M. J. (2019). Psychometric properties of three measures of “facebook engagement and/or addiction” among a sample of english-speaking pakistani university students. *International Journal of Mental Health and Addiction, 17*(4), 995-1007. https://doi.org/10.1007/s11469-018-9963-z

Upton, S. R. (2020). *Components of psychological flexibility and inflexibility that predict risk-taking behaviors* [Doctoral Dissertation, Loisisana State University]. LSU Digital Commons. https://digitalcommons.lsu.edu/gradschool_dissertations/5306

Worthington, R. L., & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. *The Counseling Psychologist, 34*(6), 806-838. https://doi.org/ 10.1177/0011000006288127

Wynne, B., McHugh, L., Gao, W., Keegan, D., Byrne, K., Rowan, C., . . . Cullen, G. (2019). Acceptance and commitment therapy reduces psychological stress in patients with inflammatory bowel diseases. *Gastroenterology, 156*(4), 935-945. https://doi.org/10.1053/j.gastro.2018.11.030

Yuen, E. K., Goetter, E. M., Stasio, M. J., Ash, P., Mansour, B., McNally, E., Sanchez, M., Hobar, E., Forte, S., Zulaica, K., & Watkins, J. (2019). A pilot of acceptance and commitment therapy for public speaking anxiety delivered with group videoconferencing and virtual reality exposure. *Journal of Contextual Behavioral Science*, *12*, 47–54. https://doi.org/10.1016/j.jcbs.2019.01.006

Zahra, S., Ahsan, S., Kiani, S., Shahbaz, K., & Andleeb, S. N. (2020). Internet gaming, emotional intelligence, psychological distress, and academic performance among university students. *NUST Journal of Social Sciences and Humanities, 35*(2), 253-270. https://doi.org/10.33824/pjpr.2020.35.2.14

Zeng, W., Chen, R., Wang, X., Zhang, Q., & Deng, W. (2019). Prevalence of mental health problems among medical students in China: A meta-analysis. *Medicine*, *98*(18). https://doi.org/10.1097/MD.0000000000015337

Zucchelli, F., White, P., & Williamson, H. (2020). Experiential avoidance and cognitive fusion mediate the relationship between body evaluation and unhelpful body image coping strategies in individuals with visible differences. *Body Image*, *32*, 121-127. https://doi.org/10.1016/j.bodyim.2019.12.002

Zuljevic, D., Rakocevic, N., & Krnetic, I. (2020). Testing the model of psychological flexibility in the Serbian cultural context: The psychometric properties of the acceptance and action questionnaire. *Psihologija, 53*(2), 161-181. https://doi.org/10.2298/psi191015006z