

The Development and Validation of Temperament Scale for University Students

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Temperament is said to be more functionally related to behavior than the structural view of personality. This research describes an attempt to develop a temperament scale for the use of clinical and research with student population. In Phase I, different temperaments were elicited from 40 university students (20 males and 20 females). Phase II comprised the expert validation of final collated list of 60 items. After pilot study, 441 university students (M 20.91, SD 1.83) were given Student Temperament Scale (STS) and Big Five Inventory (BFI, Benet-Martinez & John, 1998). The exploratory factor analysis produced six factors namely Apprehension, Impulsivity, Cautiousness, Introversiveness, Submissiveness and Extroversiveness. The scale had high face, construct, and concurrent validity along with high test retest reliability scores and internal consistency. The results are discussed in cultural implication of temperament in student counseling service.

Keywords: temperament, university students, culture, reliability and validity

The interest in studying temperament has been increased tremendously in last decades (Vorkapić & Lučev, 2014; Bhat et al., 2015). After almost 20 years of practical experience Carl Jung (1921-1971) gave a careful analysis of human temperament. Jung thought that people were born with predisposition to different types including Extraversiveness, Sensing, Intuition and Feeling. Many other explanations have been made to describe and define the very nature of the concept of temperament (e.g. Sheldon, 1942). Regarding empirical approach to study temperament types, Pavlov's typology of higher nervous activity was the first approach towards identification of differences in psychophysiology of the individuals (Pavlov, 1957). Most influential work was carried out by Thomas and Colleagues who identify the process of development of the temperament in individuals (e.g. Thomas & Chess, 1977). Literature reveals that the term personality and temperament have been used synonymously, but the last few decades have witnessed change in the use of these terms. In recent years the role of temperament in defining human behavior has gained immense consideration which is now taken as a component of human personality (Strelau & Zawadzki, 2011). Strelau (1987) discussed the differences between two, that temperament is biologically determined, identifiable in early childhood and can be seen even in animals, whereas personality is product of social environment and is shaped in later period of time.

Temperament covers the patterns how the person would view and act in the world, afterwards interaction with social environment contribute towards development of personality (Moore et al., 2005). Another phenomenal contribution in the understanding of the basic nature of personality was made by Hans Eysenck (for details Claridge, 2016) and identified three distinct

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dimensions of personality namely identified three dimensions of personality: extraversion, neuroticism and psychoticism.

Rothbart and Derry berry (1981) defined temperament as individual differences in reactivity (excitability, responsivity of the behavioral and physiological systems of the organism) and self-regulation (neural and behavioral processes functioning to modulate this underlying reactivity) assumed to have constitutional basis (relatively enduring biological makeup of the organism). Temperament can be defined as biologically derived stable behavioral characteristics and tendencies (Keller, Coventry, Heath, & Martin, 2005; Strelau, 2001). The construct of temperament can be understood in three dimensions (Buss, 1991), firstly emotionality refers to expression of intense negative emotions such as fear, anger and aggression, secondly, activity refers to hyperactive behavior such as impulsivity and impatience, lastly sociability that reflects an ability to have emotional warmth and social interaction with others.

Temperament has a long lasting impact on the development and expression of various psychological functioning of human beings (Gallitto, 2015; Rotella et al., 2015) are said to be a risk factor for different mental health problems (Nigg, 2006). Temperament is found to be related to grief reaction (Gana & K'Delant, 2011), mother-adolescent interaction (Davenport, Yap, Simmons, Shebeer, & Allan, 2011), type A behavior pattern (Wang et al., 2011) and psychopathology (Strelau & Zawadzki, 2011), depressive symptoms (Vreeke & Muris, 2012), disturbed sleep pattern (Kaley, Reid, & Flynn, 2012), oppositional defiant behavioral tendencies (Stringaris, Maughan, & Goodman, 2010) and so on. More specifically, Miettunen and Raevuori, (2012) have found that psychiatric participants as compared to control group have increased tendency to worry, being fearful and shy and less novelty seeking.

The process of human development cannot be separated from the different social, environmental and cultural influences (Matsumoto, 2007) thus leading to different temperament (Allik & McCrae, 2004). Various studies have been conducted to explore the cultural influence in expression of temperament have found similarities as well as differences in expression of temperament across culture (e.g. Gartstein, Slobodskaya, Olaf Żylicz, Gosztyła, & Nakagawa, 2010). These differences in across cultures could be due to genetic differences between diverse population, however external and environmental factors could also contribute to difference in expression of temperament (Zawadzki, Strelau, Oniszczenko, Roemann, & Angleitner, 2001). For many years the role of culture in the expression of psychological symptoms was neglected, but cross-cultural researchers have recently acknowledged the importance of culture in the psychological expressions (Matsumoto, 2006). Emerging evidence suggests that culture influences greatly the values that people hold about emotions as well as their experiential and behavioral responses to emotional situations. For instance, in the Asian culture context control of emotion i.e. decreasing emotional experiences and behaviors is valued more than in European cultural contexts (Mauss & Butler, 2010). There are a number of studies carried out to demonstrate the cross-cultural application and universality of the construct of Big Five, yet showing a mixed bag of findings indicating that five factors structure does not emerge cross-culturally (e.g. Lee & Ashton, 2004).

As far as the Pakistan is concerned, there is a dearth of literature on temperament. Very few studies have been carried out on personality dimensions with relation to different psychological constructs (Bukhtawer, Muhammad, & Iqbal, 2014), personality factors and learning styles (Mahmood, 2003), personality factors and emotional intelligence (Yousaf, 2005). These researches

have used western scales which might not depict the true picture of our culture and might have affected the outcome of the studies. Moreover, the concept of temperament remained neglected. Therefore, the current research is focused on identifying the cultural-specific experience and expression of temperament in university students.

Universities and colleges are important settings to identify and address issues of young adults (Zivin, Eisenberg, Gollust, & Golberstein, 2009). The university students face many problems ranging from personal challenges such as defining their identities, increasing social relationships, academic and career pressures and separation from home and other psychosocial issues including anxiety and depression (Saleem, Mahmood, & Naz, 2013). Some students take it as challenge to personal growth, but some get overwhelmed by these adjustments issues and experience emotional turmoil, and other mental health problems (Izadiniaa, Amiria, Jahromia, & Hamidia, 2010). Early investigations have found that temperament type may play a role of a risk factor for psychopathology in later period of life (Caspi, Henry, McGee, Moffitt, & Silva, 1995), which not only affect the academic performance of students but also their personal and social life (Vitasaria, Abdul-Wahab, Herawan, Othmana, & Sinnaduraib, 2011).

To sum up the above literature, one can say that temperament is a biological construct which has long lasting impact on the growth and development of an emerging adult. A rich research evidence suggest that temperament can be universal in nature but its manifestation and expressions could be cultural-specific. The current research will address following aims and objectives:

Research aims and objectives:

- To explore the expression of different temperaments in university students.
- To develop a valid and reliable scale for measuring temperament in university students.
- To determine the gender difference in manifestation of different temperaments in university students.

Method

Phase I: Item Generation

Participants and procedure

The construct of temperament was explored through phenomenological approach. 40 university students (20 men and 20 women) with the age range of 18-25 were approached individually. Initially, all the participants were given an operational definition of temperament as “a biological way of behaving and responding to the external environment” All participants were asked open ended question to express the attributes of different temperaments types as they see around them in their age group. On the basis of their responses a list of 70 items were collated. After excluding the repetition and ambiguity 63 items were finalized.

Phase II: Expert validation

Participants and procedure

The final list of 63 items was empirically validated by 5 experts. These experts were selected through purposive sampling comprising clinical psychologists with minimum 5 years of experience of working with university population. The list of 63 items was converted into a 6 point rating scale (0-5) where 0 denotes to “not at all” and 5 “very much so”. All experts were asked to rate each item to the extent to which it reflects the temperament in university students. Based on data obtained from this phase, 3 items were discarded which got less than 50% agreement. Finally a list of 60 items was converted into a self-report measure (Student Temperament Scale, STS).

Phase III: Translation of the Big Five Inventory

Procedure

Since there is no indigenous scale available to determine the concurrent validity of STS, therefore The Big Five Inventory (Benet-Martinez & John, 1998; John, Donahue, & Kentle, 1991) was used. BFI comprised 44 items measuring five dimensions namely Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness. Official permission was sought to translate into Urdu (The national language of Pakistan) and use for BFI from the authors. A standard procedure for translation was used as recommended by the authors by keeping the lingual and cultural appropriateness. Initially, a bilingual expert was asked to translate BFI while keeping original connotation and semantic meaning in mind. Afterwards a professor of English who lived in USA was asked to back translate the BFI. At the last phase, another bilingual expert was asked to compare both versions for similarity and no amendments were made as no problem was identified in terms of translation.

Phase IV: Pilot study

Participant and procedure

A pilot study was carried out to determine the user-friendliness and comprehension of instructions and items of both scale STS and translated version of BFI. In this try out phase, a sample of 30 university students (15 men and 15 women) was selected with purposive sampling technique. Total administration time averaging 15 minutes. No difficulty was reported in the understanding of the instructions and administration of both scales.

Phase V: Establishing Psychometric properties

Participants

441 participants were selected from four public sector universities of Lahore city. Stratified sampling technique was used to select the participants. The strata were divided across educational class and gender. The academic level comprised BS to M.Phil/MS level. There were 265 (60%) women and 176 (40%) were men with the age range of 18-25 years ($M = 20.91$, $SD = 1.83$). All those participants were excluded from this phase who took part in phase 1 and III.

Measures

Demographic Performa

The Demographic Performa included the variables of gender, age, educational class and university type i.e. Government and Private sector.

Student Temperament Scale

Indigenously developed scale STS comprised 60 items was used to measure the temperament styles in university students. This scale is a 4 point rating scale (0=Never, 1=Sometime, 3= Often, 4=Most of the Time). All participants were asked to rate each item to the extent to which it describes themselves.

The Big Five Inventory

The BFI (Benet-Martinez & John, 1998) was used to determine the concurrent validity of the STS. The BFI comprised 44 items with 5 point options in which 1 denotes to "Disagree Strongly", 2 "Disagree a Little", 3 "Neither Agree Nor Disagree", 4 "Agree a Little" and 5 "Strongly Agree". This scale measure five dimensions of personality namely Extraversion comprising 8 items, Agreeableness 9 items, Conscientiousness 9 items, Neuroticism 8 items and Openness 10 items.

Procedure

The current research was approved for any ethical consideration by the Institutional Ethical Committee. Afterwards an Official permission letter was obtained from the institute of Clinical Psychology for data collection. Four public sector universities gave permission to the researchers to collect data for the current research. All the authorities were sent brief aims and objectives of the research and also assured about the confidentiality and anonymity of the research data. Participants were approached and informed consent was obtained. All participants were introduced the research aims and they were assured about the confidentiality of the information obtained from them. All participants were also given the right to withdraw from the data collection during any time of testing. All those participants who agreed were given the final research protocol comprising demographic form, STS and BFI. Group testing was carried out averaging 20 participants at a time and a debriefing session was carried out for quarries. 5 research protocols were discarded because of missing information and final analysis was carried out on 441 participants. Informed consent was taken from 70 participants for resting with one week’s interval.

Results

The Factor Analysis was used to determine the factorial structure of Student Temperament Scale (STS). Varimax rotation was used to obtain underlying factor structure of 60 items. Scree plot was obtained to determine the number of factors. Kaiser-Meyer Olkin Measure of Sample Adequacy (KEMO) was found to be .89 and Bartlett’s Test Approx. Chi Square as ($p < 0.001$) indicates that the distribution of data is appropriate for factor analysis.

Factor Analysis

In order to establish underlying dimensions of Temperament Scale (TS), Eigen value greater than 1 criteria was used. Scree plot provided a graphical representation of the Eigen values. Initial factor solution using Scree plot indicate 7 factors on elbow. In order to have a clear picture of factors four, five and six factor solution was carried out. The six factor solution was retained for 56 items where the factor loading was equal or greater than .30. Six factor solution provided a clear factor structure with less dubious and over lapping items. In this way, four items were excluded from the scale which less than .30 loadings. This six factor solution explained 40.80 variance of the data.

Scree Plot

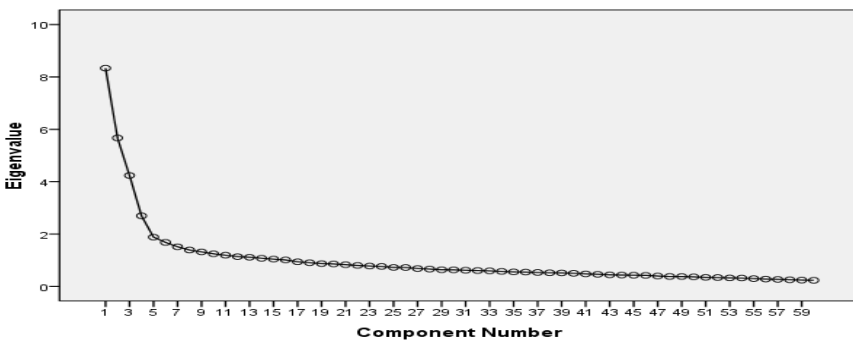


Figure 1 The Scree Plot of Student Temperament Scale

Table1*Factor Loadings for Student Temperament Scale with Varimax Rotation*

Sr. No	Item No.	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
1.	27	.51	.06	-.16	.01	.27	-.26
2.	28	.58	.27	-.07	.01	.15	-.21
3.	32	.37	.15	.14	.09	.24	-.06
4.	37	.67	.12	-.05	-.03	.01	-.12
5.	40	.49	-.07	.04	.26	.05	.02
6.	46	.50	.17	-.10	-.05	-.10	.20
7.	49	.59	.20	-.04	.14	.04	-.06
8.	50	.61	-.01	-.11	.28	.07	.01
9.	51	.59	-.09	-.08	.27	.02	.11
10.	54	.46	.23	-.05	.02	-.03	.06
11.	57	.51	.19	.03	.06	.06	.07
12.	2	.19	.49	.02	-.04	-.17	-.04
13.	5	.29	.39	-.06	.17	.02	-.22
14.	11	.26	.41	-.14	.20	.13	-.02
15.	14	-.12	.49	.13	-.16	-.11	.18
16.	15	-.06	.45	-.30	.10	.04	.20
17.	25	.28	.50	-.03	-.08	.12	-.15
18.	26	.20	.42	-.26	.02	.20	.05
19.	31	.07	.44	-.41	.09	.09	.18
20.	34	-.06	.53	-.05	.01	-.09	.16
21.	35	.18	.65	-.02	-.03	-.10	.02
22.	38	.15	.49	.08	.02	-.19	-.03
23.	44	-.30	.40	.04	-.05	.22	.20
24.	45	.25	.54	-.23	-.07	.10	.19
25.	47	.22	.40	-.25	-.24	.14	.08
26.	9	.07	-.24	.43	.19	-.10	.15
27.	10	-.20	.12	.42	-.23	.11	.27
28.	16	.27	-.28	.65	.06	-.01	.18
29.	18	.09	.02	.48	.20	.16	-.10
30.	20	-.16	-.14	.42	.16	.24	.13
31.	29	-.37	.05	.38	-.10	.17	.28
32.	33	-.16	-.26	.45	.05	.13	.18
33.	36	-.44	.08	.31	-.04	.14	.24
34.	41	-.07	-.05	.63	-.05	.05	.02
35.	42	-.07	.01	.46	.03	.09	-.19
36.	52	-.04	.15	.54	.21	.08	.02
37.	55	-.12	-.03	.55	-.07	.21	.03
38.	56	.07	.30	.38	.05	-.04	.06
39.	1	.05	.08	.09	.62	.02	.01
40.	3	.04	.07	.24	.53	-.09	-.17
41.	4*	.14	-.12	-.08	-.52	.29	.10
42.	12*	.19	-.24	.17	-.37	.04	-.06
43.	13*	.22	-.10	-.06	-.60	.19	.11
44.	19	.26	.03	.09	.61	.07	-.08

45.	22	-.01	-.02	.06	.46	.01	-.08
46.	39	.08	.11	-.04	.49	.15	.06
47.	24	.06	-.21	.13	-.11	.63	.16
48.	30	.28	.15	-.06	-.03	.59	.04
49.	43	-.02	.08	.14	-.10	.53	.01
50.	53	-.06	-.22	.15	-.06	.44	.09
51.	58	.29	.21	.07	.15	.54	-.15
52.	6	.21	.19	.12	.08	.09	.48
53.	7	.01	.06	.08	-.29	.02	.49
54.	8	.07	-.10	.21	-.15	-.20	.39
55.	23	.02	-.25	.25	-.13	.12	.36
56.	48	.18	-.06	.29	.05	.07	.42

Note. * scoring polarities was reversed because of negative correlation of item with the factor

Table 2

Eigen Values and % of Variance Explained by Six Factors of Student Temperament Scale

Factors	Eigen Values	% of Variance	Cumulative %
Apprehension	6.13	10.22	10.22
Impulsivity	4.75	7.93	18.15
Cautiousness	4.67	7.78	25.94
Introversion	4.05	6.75	32.70
Submissiveness	2.64	4.41	37.11
Extroversion	2.23	3.72	40.83

Table shows factor loadings and percentage of variance explained by six factors. A label was assigned on the basis of commonality of items in the factors. The description of these six factors is as following:

Factor 1: Apprehension

The first factor has 11 items sample items include “situational fears”, “being anxious”, “shy”, “hesitant,” and “lack of initiative taking” and so on.

Factor 2: Impulsivity

There are 14 items in the second factor consisting of "reckless behavior. It includes “being dominated by others”, “hasty”, “careless” and “aggressive”.

Factor 3: Cautiousness

There are 13 items in the third factor consisted of “being accurate”, “being organized”, “being meticulous”, “careful and cautious”.

Factor 4: Introversion

This factor contains 8 items which includes “difficulty to express the feelings”, and “being quiet” and “reserved”.

Factor 5: Submissiveness

The fifth factor includes 5 items about “selflessness”, and “giving importance to others”.

Factor 6: Extroversion

There are 5 items in the sixth factor about “sociability”, “experimenting new things”, and “novelty seeking”.

Table 3*Summary of Interfactor Correlations and Cronbach Alpha of Six Factors of Student Temperament Scale*

Factors	F1	F2	F3	F4	F5	F6	α
F1 Apprehension	---	.40***	-.24**	.37***	.22*	-.05	.82
F2 Impulsivity	---	---	-.27**	.39***	.05	.29**	.81
F3 Cautiousness	---	---	---	.09	.21*	.11	.80
F4 Introversion	---	---	---	---	.27**	.09	.77
F5 Submissiveness	---	---	---	---	---	.13	.72
F6 Extraversion	---	---	---	---	---	---	.70
<i>M</i>	14.67	16.75	22.91	11.22	10.33	10.05	
<i>SD</i>	6.44	7.15	6.25	2.98	2.44	3.73	

Note. *df*,440 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The table3 indicates that a positive correlation between Apprehension, Impulsivity, Introversion and Submissiveness Factors. A negative relationship was found between Apprehension and Cautiousness Factors.

Concurrent Validity

To establish the concurrent validity, the Student Temperament Scale and translated version of BFI were administered to university students.

Table 4*Correlations Matrix between Six Factors of Student Temperament Scale and Big Five Inventory*

Factors	Neuroticism		Extraversion		Openness	Agreeableness	Conscientiousness
	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness	Conscientiousness	Conscientiousness
Apprehension	.52***	-.09	-.06	.41***	-.09	-.09	-.09
Impulsivity	.28**	-.05	.13	.18	-.21*	-.21*	-.21*
Cautiousness	-.21*	.14	-.07	.19	.59***	.59***	.59***
Introversion	.28*	-.12*	.05	.16	.07	.07	.07
Submissiveness	.15	.04	-.06	.72***	.21*	.21*	.21*
Extraversion	-.31**	.61***	-.07	.05	.15	.15	.15

Note. *df*=440, * $p < 0.05$, *** $p < 0.01$

Table 4 shows the inter correlation of six factors of STS and BFI. Table suggests that there is positive correlation between STS's factors of Apprehension, Cautiousness, Submissiveness and Extraversion with BFI's factor of Neuroticism, Conscientiousness, Agreeableness and Extraversion respectively. STS's factor Impulsivity and BFI's Openness has weak correlation with other factors.

Test Retest Reliability

The test retest reliability was calculated after with one week's interval. The reliability score on six factors of Student Temperament Scale ranged from .80 to .90.

Split Half Reliability

The split half reliability was also calculated by using odd and even method. The split half reliability between two halves was found to be .79 ($p < 0.001$). The internal consistency of Form A and B was found as .79 ($p < 0.001$) and .74 ($p < 0.001$) respectively.

Table 5

Means, Standard Deviations, and t-values of Men and Women on Six Factors of STS

Factors	Men	Women	95%CI			
	(n=265)	(n=176)	t(439)	LL	UL	Cohen's d
	M(SD)	M(SD)				
Apprehension	15.14(6.62)	13.98(6.11)	3.17***	.42	1.98	.18
Impulsivity	16.69(7.11)	16.84(7.09)	.35(ns)	.96	.67	.02
Cautiousness	22.45(6.25)	25.49(6.21)	3.11***	1.85	4.31	.48
Introversion	11.51(2.97)	11.85(2.98)	1.98(ns)	.68	1.93	.08
Submissiveness	10.33(2.47)	10.46(2.40)	.10(ns)	.29	.26	.05
Extroversion	10.21(2.75)	8.82(2.67)	2.49**	.09	.79	.51

Note. STS= Student Temperament Scale. *df*=439***p*<0.01, ****p*<0.001

The table 5 indicates that university men and women were found to be significantly different on Apprehension, Cautiousness, and Extroversion factors on Student Temperament Scale. Men tend to score higher on Apprehension and Extroversion than women. Women participants scored higher on Cautiousness factor than men. No difference was found between men and women on Impulsivity, Introversion and Submissiveness.

Discussion

The current study intended to develop an indigenous scale of temperament for the university students which would help in identifying their reaction patterns in different situations. It has been seen that temperament is functionally related with different aspects of an individual's life (e.g. Gana & K'Delant, 2011; Strelau & Zawadzki, 2011). The manifestation and expression of temperament vary from culture to culture, being different in an individualistic culture and different in collectivistic culture which requires an indigenous instrument for its assessment.

University life brings significant biological (such as physical maturity), psychological, and cognitive challenges for students as it is time to enter in a more mature and responsible role and leaving behind a carefree life style. The type of temperament students has affects how they deal with this transition. Some students take this transition as a challenge to personal growth, but some faces problems because of these changes and experience emotional maladjustment and other mental health issues (Izadiniaa et al., 2010). Because of cross-cultural differences in the development and expression of temperament it was important to study and identify temperament types in students indigenously. For this purpose phenomenology regarding temperament was explored from university students through open-ended approach and on the basis of their responses scale was developed. The exploratory factor analysis of the scale showed six factors namely Apprehension, Impulsivity, Cautiousness, Introversion, Submissiveness and Extroversion.

The first factor of Apprehension is about being anxious, fearful, shy, hesitant, and sensitive and lack of initiative taking. This factor has resemblance with western concept of neurotic temperament (Eysenck, 1970; Costa & McCrae, 1992). This factor reflects the unassertive nature of individuals which may be a hall mark of collectivistic culture where obedience and compliance is preferred (Saleem, Mahmood, & Subhan, 2015). The second factor of Impulsivity reflects the reckless type of temperament including dominating others, being hasty, careless, fearless, extremist and aggressive. This factor reveals the uncontrollable nature of an individual and high reactivity in different situations. Literature suggests that impulsivity is one of the dimensions of temperament

(Cloninger, Svrakic, & Przybeck, 1993), but its weak correlation with any sub scale of BFI shows that expression of impulsive temperament may vary from culture to culture. The third factor is about cautiousness reflecting precision and being cautious in different situations. Individual having this kind of temperament is organized and plans things before time. This factor resembles the conscientiousness of BFI showing self-control.

The fourth factor of Introversion reflects the universal temperament type making individual reserve, quiet, and hiding feelings and emotions. Introversion has been seen in almost all personality and temperament theories (Costa & McCrae, 1992; Eysenck, 1970). The factor five is about Submissiveness which shows that individual values others than himself. It resembles Agreeableness of BFI. Being in collectivistic culture individuals who value others are more accepted and appreciated whereas, in Eastern culture promotes giving importance to others (Saleem et al., 2015). The sixth factor of Extraversion also depicts the picture of universal temperament type making individual sociable, having big circle of friends and hanging out to seek pleasure. But in eastern culture the expression of extraversion is different as in west extraverts prefer to indulge into social activities and expanded social circle which are not appreciated in eastern culture.

Conclusion

The current research is an attempt to explore the cultural-specific experience and expression of temperament for university students. The findings of the study revealed that since temperament is biological nature and can be universal yet the experience and expression of temperament was found to be culture specific. Moreover, the current scale has acceptable level of psychometric properties and can be further used for research and counseling purposes.

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