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Bridging Cultural Divides: Psychometric Properties of the Urdu Adaptation of the Adult Temperament Questionnaire (ATQ-U)

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Abstract

Assessment is an essential aspect of evaluating the mental attributes of individuals. Assessment becomes fruitful when it best assesses, is subject-specific and culturally relevant, and gives significant outcomes. Thus, the current research formed an indigenous version of adult temperament assessment. To best assess and form a culture-specific assessment measure for Pakistani adults. This study aimed to translate and validate the English version of the Adult Temperament Questionnaire, short form (ATQ). It was translated into Urdu for use in Pakistan. Forward and backward translation was the adopted method for translating measuring instruments. Six bilingual experts were included in this process. To assess the psychometric properties of the translated Urdu version of the ATQ-U, it was administered to a random sample of 280 healthy male and female university students aged from 18 to 41 years old. The average age of the respondents was 22 (S.D = 5.36). Results indicate the Cronbach's Alpha and McDonald's ω coefficients, significant inter-item, and inter-subscales correlations of four broad domains and related sub-scales of the ATQ-U, which ranges from .89 to .97, respectively. As well the statistical results aligned with the original ATQ scale results. Future studies aimed to conduct the translated Urdu version of the ATQ among the general population of different regions and provinces of Pakistan for greater generalizability and validity.

Keywords: Adult Temperament Questionnaire, ATQ, Pakistan, Urdu Version

Introduction

Temperament has a long history that was initialized many years ago. It was conceptualized that temperament perspectives started from the idea of Greek. As the behavior and mood of humans are the results of balance in four body humor: blood; yellow bile; black bile; and phlegm. It characterizes humans into four types of individuals having different personality traits based on the predominance of this four-body humor. Such as choleric individuals, who have predominant yellow bile, are quick to anger, and are irritable individuals. Miserable individuals, with the predominance of black bile, are anxious and sad. Sanguine persons have predominant blood levels and are outgoing and positive, and phlegmatic persons having predominant phlegm, are slow in developing feelings and actions (You et al., 2022).

By this antique model, temperament was perceived as derived from an emotional and physical process. This view is still consistent and applicable in the context of present temperament perspectives (Zuckerman, 1995). Such as Goncalves and Cloninger (2010) define temperament as automatic and stable emotional reactions that are determined by genetic dispositions (Derryberry & Rothbart, 1988). The other initiations in temperament perspectives were also started. Likewise, recent empirical evidence of childhood temperament was conceptualized by Thomas & Chess (1977). They began longitudinal research of early-emerging behavioral styles of children in 1956 (Thomas & Chess, 1977). Similarly, Thomas and Chess also developed an interest in childhood temperament. As well as numerous research studies were done consistently in this area. Diverse temperament models were presented. But authors and practitioners of temperament do not still agree upon the temperament definition explained in prior history. However, the most significant temperament definition came from the concepts and work of Rothbart (Rothbart et al., 2000: Rabinowitz et al., 2019).

Derryberry and Rothbart (1988) defined temperament as individualistic in self-regulation and reactivity perceived to have a constitutional base. They defined constitutionally as the comparatively lasting physical development of the organism, influenced by heredity, experience, and maturation over time (Rothbart et al., 2000; Sanson & Rothbart, 1995). Temperament is also defined as a set of particular characteristics that are evident in early infancy and which continue consistently up to adulthood (Slobodskaya, 2021). In other words, temperament is conceptualized as permanent moods and different behavioral styles (Clark & Watson, 1995). Furthermore, another model was given by Rothbart et al. (2000) to further conceptualize temperament perspectives and the Greek model of temperament. This model illustrates the essentiality of individualities in the process of emotions. As emotions comprised of diverse positive and negative feelings. These feelings made individual differences. As well as mirror the reactivity of children to the community. In contrast with the Greek model, this model stresses equally the essentiality of individualities in the continuity of responsive aptitudes through consideration and other faces of self-regulation. According to this advanced perspective, temperamental qualities initiate during childhood period. These are strictly related to physical processes and are partially formed by heredity. As well as experiential activities also form these qualities of development. This model was strongly supported by the present models of temperament (Zentner & Bates, 2008).

In a similar context, Rothbart and Evans (2008) also gave the model of temperament for adults. In this model, they gave four groups of temperaments. These are Negative effects having fear, sadness, discomfort, and frustration as dominant emotions. Extraversion has sociability, positive affect, and high-intensity pleasure. Effortful Control had attentional control, inhibitory control, and activation control as major traits. Lastly, the Orienting Sensitivity had neutral perceptual sensitivity, affective perceptual sensitivity, and associative sensitivity (Evans & Rothbart, 2007). So, Temperament was widely described as a person's traits, inclined by habit, or mode of emotional response (Brieger, 2008). In the wholesome, the clinical and historical information in this field is extensive. Thus, it can be characterized as the theme of temperament being a focal perspective. It was based on the interest of researchers. It was conceptualized according to the context or perspective of the researcher. Thus, its assessment was also a matter of focal perspective. Therefore, numerous assessment tools were made following this perspective. At present, there is trending empirical assistance for this perspective. Thus, this empirical evidence is the theoretical and background support in the current scenario. The current research tried to make an assessment of temperament in the Pakistani population. As well as to make subject-

specific, subject-involvement, consequentially, and culturally relevant assessment measures of temperament. The primary intent of this research was the translation of the English version of the Adult Temperament Questionnaire, short form (ATQ) into Urdu. The validation of the Urdu version of ATQ was also made. It will provide a valid and reliable measure in the national language to access the construct of ATQ for the Pakistani Population.

Objectives of the Study

A valid and reliable translated Urdu version of ATQ was formed for the following objectives 1. Translation of the English version of the Adult Temperament Questionnaire (ATQ) into Urdu for the Pakistani sample. 2. Assessment of psychometric properties of the Urdu version of the Adult Temperament Questionnaire (ATQ).

Scope of the Study

The scope of this study includes translation and validation of the Urdu version of the Adult Temperament Questionnaire (ATQ) for the Pakistani sample. This study aimed to form subject and culture-specific assessment measures for the adult population and better assess the adult temperament. The study was conducted using a combination of literature review, survey research, and other research on the psychometric properties of the ATQ scale.

Significance of the Study

The significance of this study lies in its ability to contribute to the current body of knowledge for assessing adult temperament. It results in the addition of culture-specific assessment measures for the Pakistani adult population. By translating and validating the Urdu version of ATQ, this study aims to provide valuable insights into four major domains of adult temperament assessed through ATQ. This research can guide researchers, psychologists, and policymakers in making programs to promote adult personalities. Additionally, this study can be used as a reference for future research to add in psychometric properties of the Urdu version of ATQ.

Method

Participants

The sample consists of 280 participants, with a mean age of 22 years (SD = 5.36) and an age range of 18 to 41 years. The gender distribution shows that 56.4% of participants are female (n = 158) and 43.6% are male (n = 122). In terms of residential area, 69.6% of participants reside in urban areas, while 30.4% live in rural areas. The family setup is split between nuclear families (55.0%) and extended families (45.0%). Socioeconomic status is categorized into three groups: low (19.3%), middle (47.1%), and high (33.6%). Similarly, household income is distributed with 19.3% of participants earning between 5,000–10,000, 47.1% earning between 10,000–50,000, and 33.6% earning more than 50,000. These descriptives provide a clear understanding of the demographic makeup of the sample, including gender, residential area, family structure, socioeconomic status, and income.

Procedure

The current study was comprised of two-phase procedures i.e., phase 1 and phase 2.

Phase 1

In this phase, the English version of the Adult Temperament Questionnaire (ATQ) was translated into Urdu.

Translation committee. Six bilingual experts were included in the translation committee. One of them was the committee chair with having Ph.D. in Psychology. Three of them were students of M. Phil / Ph.D. in Applied Psychology, one was an expert in the English language and the other was an Urdu language expert. Although, the individuals who belonged to the occupation of psychology had numerous types of research in universities that were recognized by the Higher Education Commission (HEC) as well as had expertise in both English and Urdu languages.

The procedure of Urdu translation of ATQ. It was comprised of the following systematic translation procedure.

Step 1. Forward translation. By getting permission from the author, the ATQ scale was translated into Urdu. For that purpose, three parallel Urdu translations of the Adult Temperament Questionnaire (Evans & Rothbart, 2007) were made by three committee members. Two were from the psychology profession and one from the Urdu profession.

Step 2. Selection of the translated items. The three Urdu translations were reviewed by the committee chair. He critically reviewed every item and finalized the most appropriate Urdu version of ATQ.

Step 3. Backward translation. The finalized Urdu version of ATQ was back-translated into English by other two committee members. The original English version of the scale wasn't revealed to them. After that, both back translations were reviewed by the bilingual expert. Then the finalized items that were most appropriate and closest to the original English version of ATQ were finalized.

Step 4. Matching the translated scale with the original scale. After comparing and matching the back-translated version with the original scale. The concluding back-translated version was sent to the first author for review.

Step 5. Proofreading. After approving one translated Urdu version by all committee members using In-page (Urdu writing software). Proofreading was completed for the correction of any mistakes (i.e. sentence structure, words, and other errors). It made the Urdu version of ATQ free from any errors. As well as to move on Urdu version of ATQ validation. Such as administering the Urdu version ATQ on the sample for the assessment of the psychometric properties of this version.

Phase 2

This phase focused on sampling for study, analyzing, and validating the Urdu version of ATQ.

Sampling for the Study. In the first step of validating the Urdu version of ATQ, the sample size and sampling strategy were considered. 280 university males and females aged 18-41 years were randomly sampled. These university males and females are comprised of regular students. The majority of the sample belonged to middle SES.

Data Collection and Analysis. After completing the translation phase, the researchers individually administered the scale to participants individually, ensuring confidentiality and voluntary participation. After explaining the research purpose and obtaining consent, participants completed questionnaires, including a demographic sheet and the Urdu ATQ. The researcher

clarified any confusion and ensured completion. The ATQ was scored using standard methods, including descriptive statistics. Reliability was assessed through Cronbach's alpha and inter-subscale correlation (Saleem et al., 2015). With the suggestions of the panel and following Clark and Watson (1995), important changes were made from the original scale of ATQ because of perceiving cultural differences (Saleem et al., 2015). During the establishment of psychometric properties, the researcher also found these items redundant. Likewise, item 44 (I would probably not enjoy a fast, wild carnival ride) and item 64 (I would enjoy watching a laser show with lots of bright, colorful flashing lights). Because the inter-item correlation of these two items was very low and negative, these items were excluded from the translated Urdu version of ATQ.

Results

In this section, the collected data from the adults were statistically analyzed. A different analysis (i.e., Cronbach's alpha and McDonald's ω reliability, inter-item, and inter-subscale correlation) was used to assess the psychometric properties of the Urdu version of the Adult Temperament Questionnaire (ATQ) by using Jamovi 2.6.2. The results of the statistical analysis of the original English and Urdu scales are discussed in Table 1.

Table 1 *Comparative Reliability Statistics of Original and Urdu Versions of Adult Temperament Questionnaire*

Scale and Subscales	Original ATQ		ATQ-U			
	Item	*α*	*M*	*SD*	*α*	*ω*
Negative Affect	26	.81	4.89	0.775	0.89	0.89
Fear	7	.64	4.97	1.33	0.95	0.95
Frustration	6	.62	4.74	1.18	0.95	0.95
Sadness	7	.69	4.92	1.43	0.97	0.97
Discomfort	6	.72	4.94	1.52	0.97	0.97
Effortful Control	19	.78	3.80	0.760	0.89	0.90
Activation Control	7	.60	3.79	0.849	0.92	0.92
Attentional Control	5	.69	3.74	1.49	0.98	0.97
Inhibitory Control	7	.73	3.85	1.13	0.95	0.95
Extraversion / Surgency	15	.75	4.34	1.27	0.96	0.96
Sociability	5	.71	4.15	1.69	0.98	0.98
High-Intensity Pleasure	5	.68	4.39	1.46	0.97	0.97
Positive Affect	5	.62	4.45	1.45	0.95	0.95
Orienting Sensitivity	15	.85	4.29	1.12	0.92	0.93
Neutral Perceptual Sensitivity	5	.64	4.53	1.30	0.95	0.95
Affective Perceptual Sensitivity	5	.79	4.06	1.79	0.97	0.97
Associative Sensitivity	5	.67	4.28	1.34	0.95	0.95

Note. α = Cronbach's alpha, ω = McDonald's omega

Table 1 presents the comparative reliability analysis of the original Adult Temperament Questionnaire (ATQ) and its Urdu version, which reveals a notable enhancement in psychometric properties following translation. While the original scale demonstrated acceptable reliability with Cronbach's alpha values ranging from .60 to .85 across domains and subscales, the Urdu version exhibits substantially higher internal consistency with Cronbach's alpha and McDonald's omega values consistently above .90 for all subscales. The four main domains (Negative Affect, Effortful Control, Extraversion/Surgency, and Orienting Sensitivity) show particularly strong improvements, with the Urdu version's reliability coefficients exceeding those

of the original scale by approximately .10 to .20 points. This significant improvement in reliability suggests that the cultural adaptation and translation process has successfully maintained or even enhanced the questionnaire's ability to consistently measure the intended temperament constructs in the Urdu-speaking population. The exceptionally high reliability coefficients of the Urdu version (mostly above .94) indicate that it may be a more internally consistent measurement tool than the original English version, potentially offering more precise assessment of temperament traits in its target population. These results indicate that the Urdu version provides consistent measurements of temperament traits that are comparable in reliability to the original English ATQ (Evans & Rothbart, 2007). The inter-subscales correlation matrix was further explored, which illustrated the relationships among various temperament traits from the Adult Temperament Scale, highlighting their significance levels. The analysis reveals several noteworthy positive correlations, as shown in Table 2.

Table 2 *Correlation Matrix of Adult's Temperament Traits, Key Relationships with Interpretation*

Variables	r	*P*	Relationship	Interpretation
Fear & Frustration	.20**	.001	Positive	As fear increases, frustration also tends to increase.
Fear & Discomfort	.36***	<.001	Positive	Higher levels of fear are associated with higher levels of discomfort.
Fear & Attentional Control	-.40***	<.001	Negative	Individuals with higher fear levels tend to have lower attentional control.
Fear & Inhibitory Control	-.31***	<.001	Negative	Higher fear is linked to lower inhibitory control, indicating less ability to manage impulses.
Fear & Sociability	.17**	.006	Positive	Higher levels of fear are somewhat related to increased sociability, but the connection is weaker.
Frustration & Sadness	.17**	.004	Positive	Increased frustration is associated with higher levels of sadness.
Discomfort & Sociability	.29***	<.001	Positive	Individuals with higher discomfort levels tend to be more sociable.
Attentional Control & Inhibitory Control	.40***	<.001	Positive	A strong relationship between attentional focus and the ability to control impulses.
Inhibitory Control & Sociability	.57***	<.001	Positive	Greater inhibitory control is strongly related to increased sociability.
High-Intensity Pleasure & Sociability	.50***	<.001	Positive	Enjoyment from intense activities is associated with higher sociability.
Positive Affect & Sociability	.52***	<.001	Positive	People with higher positive emotions tend to be more sociable.
Affective Perceptual Sensitivity & Sadness	.36***	<.001	Positive	Greater sensitivity to emotional stimuli is related to increased sadness.
Neutral Perceptual Sensitivity & Positive Affect	.29***	<.001	Positive	Higher sensitivity to non-emotional stimuli relates to increased positive affect.
Associative Sensitivity & Inhibitory Control	-.29***	<.001	Negative	Higher associative sensitivity is linked to lower inhibitory control.

*Note: *p < .05, **p < .01, ***p < .001*

Table 2 highlights the most significant relationships between the traits, including the strength and direction of their associations. Positive correlations (values closer to +1) indicate that as one trait increases, the other also tends to increase, while negative correlations (values closer to -1) indicate an inverse relationship. The asterisks next to the p-values indicate the level of statistical significance, with three asterisks showing the highest level of significance.

Discussion

The findings from the translation and adaptation of the Adult Temperament Questionnaire (ATQ) into Urdu provide significant insights into the psychometric properties of this instrument within the Pakistani cultural context. The reliability analysis demonstrated that the Urdu version of the ATQ maintained consistency comparable to the original English version, as indicated by Cronbach's alpha values ranging from 0.89 to 0.97 across the four broad domains of temperament (Negative Affect, Effortful Control, Extraversion, and Orienting Sensitivity). These findings are consistent with studies that have demonstrated the ATQ's reliability in different cultural contexts, such as Laverdière et al. (2010), who reported similar coefficients when adapting the ATQ to the French-Canadian population. This supports the assertion that the ATQ is a robust tool for cross-cultural temperament research.

In recent years, cross-cultural validation of temperament questionnaires has been increasingly emphasized. For instance, a study by Marchetti et al. (2018) examined the psychometric properties of the ATQ across various European populations, reporting reliability coefficients that mirrored those found in the original ATQ validation studies. This further confirms that temperament constructs, as measured by the ATQ, are applicable across diverse cultural backgrounds, provided appropriate translation and adaptation procedures are followed.

Furthermore, the inter-subscale correlations observed in the Urdu version of the ATQ align with established temperament theory and prior research. The negative correlation between Effortful Control and Negative Affect ($r = -.216$, $p < .01$) is consistent with Rothbart's temperament model, which highlights the regulatory role of effortful control in mitigating negative emotional responses. Similar findings have been replicated in recent studies on adult temperament, including those conducted by You et al. (2022), who found that effortful control was negatively associated with maladaptive emotional responses in a South Korean sample. Moreover, the positive correlation between Orienting Sensitivity and Negative Affect ($r = .230$, $p < .01$) supports Rothbart and Evans' (2007) theory, which links heightened sensory sensitivity with greater emotional reactivity. This result echoes recent findings in cross-cultural temperament studies, such as Van Beveren et al. (2019), who observed similar patterns in Japanese adults.

The translation process followed best practices, as outlined by Brislin (1970), including forward and backward translation by bilingual experts to ensure that both the semantic and conceptual meanings of the original scale were preserved. The removal of culturally irrelevant items, such as those related to carnival rides and laser shows, was crucial for increasing the scale's relevance to the Pakistani context, an approach often recommended for culturally sensitive psychological instrument adaptation. Contemporary literature, such as works by Brislin (1970) and Haslberger (2005), also emphasizes the importance of cultural adaptations in maintaining construct validity in psychological scales, suggesting that small adjustments in content can significantly impact the tool's effectiveness in new cultural contexts.

Given the moderate to high-reliability scores and the significant correlations between subscales, the Urdu version of the ATQ is a viable instrument for assessing temperament in Pakistani adults. Future research should focus on expanding the sample size and geographic representation to enhance the generalizability of these findings across Pakistan's diverse regions and provinces. Additionally, ongoing studies on temperament and its role in mental health and social behavior suggest that the Urdu ATQ could be a valuable tool for exploring the relationship between temperament traits and outcomes such as emotional regulation, stress response, and personality development in non-Western contexts. For example, it has been highlighted that the role of temperament in predicting academic achievement and emotional well-being in various cultural settings (Costa & Faria, 2024; Nieto et al., 2014), highlighting the importance of culturally relevant tools like the Urdu ATQ for advancing research in Pakistan.

In conclusion, the Urdu version of the ATQ exhibits solid psychometric properties, making it a reliable and valid instrument for assessing temperament in the Pakistani population. This study contributes to the growing body of literature on the cross-cultural applicability of temperament measures and highlights the importance of culturally sensitive adaptations of psychological tools.

Limitations and Recommendations

As well as its strengths, some limitations with appropriate recommendations of the present study were also signified. For example, the scale sample only includes university adults. There was a limitation of exclusion of other adult populations. Future research must include other adult populations. The self-report measures had an issue of social desirability. That is a threat to internal consistency. The current measure was also self-reported. So, it's feasible to use one or more than one method to limit the threat of social desirability. Representativeness is the core of reliable results. As there were unequal numbers of male and female university adults. Thus, the present research lacks representativeness. Future research should include and focus on the representativeness of the sample to get more reliable results. The data was collected from adults from a specific university. So, it is recommended to include adults from other universities, cities, or provinces of Pakistan for reliability, validity, and generalizability as specific university adults were taken for data collection. The research had a limited sample size. Thus, future research includes a vast sample size of adults to check or increase construct validity, reliability, or psychometric properties of the Urdu version of the ATQ scale. Lastly, adults with different demographics need to be considered to assess the demographical effects on the Urdu version of ATQ. As well as comparative studies that develop and further enhance the psychometric properties of the Urdu version of ATQ.

Implications

Temperament as a cluster of mental attributes impacts every domain of any age group. Thus, the findings of the present research showed and measured the four main domains of adult temperament. That proves helpful in measuring the temperamental domains of Pakistani adults in their culture-specific language. The proposed version of the ATQ scale can develop an understanding of the need for different smoothing and promoting factors to improve the assessed temperamental domains of university adults. Furthermore, it provides a ripe ground for substantiating the findings and further addition of literature and psychometric properties on this topic. Similarly, the proposed version of the ATQ scale makes a significant contribution to the existing body of knowledge in the fields of psychology, personality, psychological assessment, and other fields. It will also help professionals, psychologists, researchers, and policymakers to understand the dynamics of temperament in Pakistani university adults. To develop social and

psychological programs to assist university adults. Thus, they can manage their temperament and temperamental issues in a better way. Lastly, the inclusion of more than one expert in forward and backward translation decreases the misinterpretation of items' meaning and increases the reliability of the Urdu version of ATQ.

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