

The Big Five model of personality in Bangladesh: examining the Ten-Item Personality Inventory

Nurul Islam

Department of Psychology, University of Chittagong, Bangladesh

Researchers, over the world, often create very brief measures of Big Five personality dimensions, so that they can assess people's personality in a reasonably short period of time. The most prominent and well-established measure among all brief personality measures is the 'Ten Item Personality Inventory' (TIPI). The present study aimed to translate, adapt, and validate the TIPI for use in the Bangladeshi culture. After completing the standardized translation procedure, the Bangla version of the Ten Item Personality Inventory (TIPI-B) was examined in a study including 662 Bangladeshi adults. Though an exploratory factor analysis with one half of the sample ($n = 330$) had explained 77.53% of the total variance, it did not show the scale's five dimensions as independent with two items for each. Acceptable goodness of fit indices ($\chi^2/df = 3.177$, GFI = .960, CFI = .935, TLI = .937, SRMR = .061, and RMSEA = .76) were found for the scale through a confirmatory factor analysis performed on the second half of the sample ($n = 332$). Acceptable internal consistencies, significant test-retest reliabilities, and convergent and discriminant validities were established in the scale through different statistical analyses. Thus, the TIPI-B with its five dimensions can be used as a valid and reliable measure to assess the personality of Bangladeshi people.

Key words: Big Five, TIPI, EFA, CFA, validity, Bangladesh

Highlights:

- TIPI-B personality inventory was adapted to Bangla.
- Results of CFA supported the theoretical five-factor structure of the scale.
- Results showed good psychometric properties of the scale on the Bangladeshi sample.

Corresponding author: mnipsy@cu.ac.bd

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The Big Five Model (BFM) is one of the most prominent dimensional measures of personality. It describes personality in terms of five broad factors (Goldberg, 1993). The BFM has widely been used over the world and has empirically been validated (John & Srivastava, 1999; McCrae & John, 1992; Mlacic, 2002; Tatalovic Vorkapic, 2014). It is used to describe an individual's personality with five different factors. These five factors are openness, conscientiousness, extraversion, agreeableness, and neuroticism. Like the BFM, the five-factor model (FFM) is the other prominent dimensional model of personality and it also describes human personality in terms of five broad factors (McCrae & Costa, 1987, 1996, 1999). These two models are often used interchangeably when considering the trait approach to personality. On the basis of these models, the 'ten item personality inventory' (TIPI) was developed (Gosling, Rentfrow, & Swann, 2003). These five personality factors are at least partially heritable (Loehlin, McCrae, Costa, & John, 1998), adaptive to the environment (Buss, 1996), universal in pattern (McCrae & Costa, 1997), and stable over a 45-year period (Soldz & Vaillant, 1999). Each factor of the BFM claims a number of correlated and more specific primary factors. For example, extraversion is said to include such related traits such as assertiveness, warmth, activity, excitement seeking, positive emotions (Matthews, Deary, & Whiteman, 2003). Though the BFM is a robust model, however it suggest directions for supplementary the Big Five when one wishes to extend variable outside the domain of five personality markers (Saucier & Goldberg, 1998). Some researchers suggest that some important personality traits lie beyond the BFM due to natural language problems (Paunonen & Jackson, 2000). Other researchers believe that some dimensions of personality are shared by all cultures, so cross-cultural studies can be applied in the BFM (Funder, 2001).

The FFM is a hierarchical organization of personality traits in terms of five dimensions and it supports its applicability across observers and cultures (McCrae & John, 1992). There are significant relationships between different character strengths (24) and traits (6) with the FFM (MacDonald, Bore, & Munro, 2008). These dimensions are grounded in information about a person's behaviour (Lamiell, 2009). An extroverted person could be described as active, enthusiastic, warm, assertive, and sociable. An individual with high agreeableness can be described as trusting, appreciative, compassionate, generous, and sympathetic. A highly conscious individual is ethical, competent, reliable, organized, and responsible. A highly neurotic person would be viewed as anxious, tense, worried, and hostile. An individual with high openness is imaginative, aesthetic, artistic, curious, and insightful (John & Srivastava, 1999; McCrae & John, 1992). The BFM has been structured and analysed by different researchers who explored the underlying factors of personality using factor analysis (Digman, 1990; Fiske, Shrout, & Fiske, 1995). The five-factor structure of BFM is assumed to represent the basic structure behind all personality traits

(O’Conner, 2002). Different researchers used somewhat different methods to explore the factor structure of BFM (Costa & McCrae, 1985; Goldberg, 1982; McCrae & Costa, 1987; McCrae & John, 1992; Peabody & Goldberg, 1989; Saucier & Goldberg, 1996). DeYoung, Quilty, and Peterson (2007) proposed that each of the Big Five factors consists of two correlated aspects.

Several measures have been developed with the aim of assessing the big five dimensions of personality, such as the NEO Personality Inventory (NEO-PI), its revised version (NEO-PI-R), and its shorter version of Five-Factor Inventory (NEO-FFI) by Costa and McCrae (1992); the Big-Five Inventory (BFI) by Benet-Martinez and John (1998) and by John and Srivastava (1999); the Trait Descriptive Adjectives (TDA) by Goldberg (1992) and its shorter version (TDA-S) by Saucier (1994), etc. Though the BFM has enjoyed considerable support, it has not been accepted universally (Block, 1995). The BFM has recently been used to examine the relationship between personality and health related issues (Roberts et al., 2007), between personal and social values (Aluja & Garcia, 2004), between personality and academic motivation and performance (Hazrati-Viari, Rad, & Torabi, 2012), between personality and subjective vitality (Deniz & Satici, 2017), and between well-being and mental health (Siegler & Brummett, 2000). The BFM has been applied in a variety of languages and cultures such as Chinese (Trull & Geary, 1997), German (Ostendorf, 1990), Indian (Lodhi, Deo, & Belhekar (2002), etc. The BFM has successfully been confirmed across cultures (Thompson, 2008) and across Hofstede’s cultural dimensions (McCrae & Terracciano, 2005). All the individuals have personal characteristics which can be labelled as personality; makes people uniquely themselves to their specific cultures (Friedman & Schustack, 2016).

Why is a Brief Measure Needed?

A brief form of personality measure is needed in some circumstances where a multi-item scale is not found to be an ideal form (Gosling et al., 2003). Paulhus and Bruce (1992) used an extremely brief form measure (i.e., a single item measure) to measure several personality traits among respondents in a short testing session. A single item measure was also used in other studies (e.g., Robins et al., 2001a, 2002) in which the researchers thought that the multi-item scale would require enough time to complete scale items and the single item measure would eliminate item redundancy, fatigue, frustration, and boredom. Burisch (1997) showed that a short form of scale (e.g., a 9-item depression scale) can be as valid as a long and sophisticated scale. Researchers often create short forms from their original long forms so that they can assess a larger number of constructs in a relatively short testing session. The shorter version scale evaluates a particular construct in a simple and easy way and it is less expensive and time consuming (Kwon et al., 2013). Moreover, it can allow for the measurement of multiple variables at the time, enabling researchers to test a larger number of hypotheses (Widaman et al., 2011).

Ten Item Personality Inventory (TIPI)

The ten-item personality inventory (TIPI) was developed by Gosling, Rentfrow, and Swann Jr. in 2003. It is an extremely brief self-report measure of personality developed to measure the Big Five personality dimensions. The TIPI, as its name suggests, consists of 10 items with five dimensions, with each dimension assessed by 2 items. The construction of TIPI went through some important statistical procedures (Gosling et al., 2003). One was the examination of item-total correlations during which the developers selected the best performing items from the longer test. They adopted and used the strategy provided by Hazan and Shaver (1987) to select the descriptors that capture the breadth of Big-Five dimensions. They also followed recommendations provided by John and Srivastava (1999). Thus, they consensually selected descriptors from the existing Big-Five instruments, for example, Goldberg's (1992) list of unipolar-bipolar Big-Five markers, adjectives from the BFI, and John and Srivastava's (1999) Adjective Checklist Big-Five markers. The TIPI items were selected on the basis of following guidelines: a) include items for all facets of the Big Five dimensions, b) include items for both poles of each dimension, c) items should not be extreme, d) items should not be negatively formulated, and e) redundancy between descriptors should be minimized.

The original TIPI (Gosling et al., 2003) has been translated and adapted to different languages and cultures. Atak (2013) aimed to assess the applicability of the Turkish-TIPI among Turkish young people. Item analysis, results of EFA, CFA, and convergent validity were found to be good for this scale. A standard translation and validation procedure had been conducted on Spanish and Catalan versions of the TIPI (Renau et al., 2013). Both versions of the TIPI showed acceptable psychometric properties. Psychometric properties of the Chinese version of TIPI (e.g., test-retest reliability, convergent and discriminant validity) were established in Chinese people (Carciofo et al., 2016). The Dutch-TIPI was shown to be a valid alternative to the existing FFM of personality (Hofmans, Kuppens, & Allik, 2008). The French-TIPI had acceptable psychometric properties with a satisfactory level of temporal stability and convergent validity with BFI-44 (Storme, Tavani, & Myszkowski, 2016). The German-TIPI provided an efficient approximation for longer measures of five personalities-constructs (Muck, Hell, & Gosling, 2007). It showed good psychometric properties such as internal consistency, factor structure, convergent and discriminant validity, etc. Significant levels of reliability and validity were found in the BFI-10 scale between English and German samples (Rammstedt & John, 2007). The Portuguese-TIPI was a reliable and valid alternative to longer personality measures (Nunes et al., 2018). The Japanese-TIPI demonstrated acceptable levels of reliability and validity, and provided an adequate representation of the Big-5 model (Oshio, Abe, & Cutrone, 2012; Oshio, Abe, Cutrone, & Gosling, 2013).

Although the TIPI was somewhat inferior to standard multi-item instruments, it showed adequate test-retest reliability and convergent validity (Gosling et al., 2003). Factor structure and convergent validity with the 50-item international personality item pool (Goldberg et al., 2006) were adequate (Ehrhart et al., 2009). The Spanish-TIPI exhibited reasonably acceptable psychometric properties such as test-retest reliability, factor structure, and convergent validity (Romero et al., 2012).

Rationale of the Study

In Bangladesh, a very small number of Bangla personality scales are available for personality assessment. Some of them are the 60-item Personality Assessment Questionnaire (PAQ; Jasmine, Uddin, & Sultana, 2007), originally developed by Rohner and Khaleque (2005); the 90-item Eysenck Personality Questionnaire (EPQ; Rahman & Eysenck, 1980), originally developed by Eysenck and Eysenck (1975); the 45-item Big-5 Personality test (Muhammad, Akter, & Uddin, 2011), originally developed by McCrae and Costa (1999); the 44-item Big Five Inventory (BFI-44; Muhammad, Semul, & Sultana, 2015), originally developed by Guilford (1993); and the 48-item short form of the Revised Junior Eysenck Personality Questionnaire (JEPQR-S; Roy, 2012), originally developed by Corulla (1990). All of these scales (45–90 items) are longer than the TIPI (10 items), are more or less are familiar in Bangladesh and their psychometric properties, such as test-retest reliability, reliability between the original and translated versions, and internal consistency reliabilities were examined in published studies. Due to a larger number of items these instruments consist of, test-takers are often reluctant to complete them. To overcome this limitation, this study will try to adapt a short personality scale to measure personality dimensions among Bangladeshi people.

Objective of the Study

The objective of the present study was to translate, adapt, and validate the Bangla version of the Ten-Item Personality Inventory (TIPI-B).

Methods

Sample of the Study

To conduct the present study, 662 adult people from the general population, age ranging from 15–60 years ($M = 42.98$, $SD = 8.74$), were selected through convenience sampling, from Chittagong division, Bangladesh. Socio-demographics of the whole sample as well as the subsamples created for the calculations presented in this paper are presented in Table 1. The Independent sample t and chi-square test revealed no significant differences between two subsamples.

Table 1
Socio-demographic Characteristics of Participants

Variable		Whole sample (<i>N</i> = 662)	Subsample 1 (<i>n</i> = 330)	Subsample 2 (<i>n</i> = 332)	Differences between subsamples		
					χ^2	<i>df</i>	<i>p</i>
Gender	Male	306 (46.22)	157 (47.58)	149 (44.88)	.484	1	.487
	Female	356 (53.78)	173 (52.42)	183 (55.12)			
Residence	Urban	226 (34.14)	110 (33.33)	116 (34.94)	.220	2	.896
	Suburban	198 (29.91)	99 (30)	99 (29.82)			
Education	Rural	238 (35.95)	121 (36.67)	117 (35.24)			
	Elementary	26 (3.93)	15 (4.55)	11 (3.31)	3.39	5	.846
	Jr. school	105 (15.86)	47 (14.24)	58 (17.47)			
	SSC	163 (24.62)	87 (26.36)	76 (22.89)			
	HSC	44 (6.65)	20 (6.06)	24 (7.23)			
	Graduation	274 (41.39)	145 (43.94)	129 (38.86)			
	Post Grad.	50 (7.55)	16 (4.85)	34 (10.24)			
Age <i>M(SD)</i>		42.98(8.74)	43.62(8.86)	42.34(8.62)	<i>t</i> =1.05	660	.133

Note. SSC = Secondary school certificate; HSC = Higher secondary school certificate.

Measures Used in the Study

Three personality measurement scales were used to pursue the present study. These were: a) the 'Ten-Item Personality Inventory' (TIPI), b) the Bangla version of 'Ten-Item Personality Inventory' (TIPI-B), and c) the 'Bangla Big Five Inventory' (BFI-44-B).

Ten Item Personality Inventory (TIPI). The TIPI is a 7-point Likert-type scale originally developed by Gosling et al. (2003). The scale consists of 10 items, in which each item consists of a question asking the subject to indicate the extent to which you agree or disagree with the statement. Responses are given weights of 1 for *very strongly disagree*, 2 for *moderately disagree*, 3 for *disagree a little*, 4 for *neither agree nor disagree*, 5 for *agree a little*, 6 for *moderately agree*, and 7 for *very strongly agree*. The items of TIPI are arranged in the following order: extraversion (1, 6), agreeableness (2, 7), conscientiousness (3, 8), neuroticism (4, 9), and openness (5, 10). There are reverse scores for items 2, 4, 6, 8, and 10. An individual's average score on each dimension reflects his/her personality on each dimension independently. Each item on the scale consists of two adjectives, separated by using a comma. It takes about a minute to complete all items. The scale showed adequate test-retest reliability and convergent validity with Big-Five measures.

The Bangla version of the Ten-Item Personality Inventory (TIPI-B). The translation procedure of the scale followed the guidelines provided by the International Test Commission (ITC, 2017). To translate and adapt the TIPI into Bangla; I did not take permission from the developers of the scale, because there were no legal restrictions or copyright laws on its use. Gosling, in his university webpage, said that anyone can use this scale for any purpose, with no need to ask for permission. A focused group discussion (FGD) with 8 adult people was carried out to obtain expert assessment about the scale if translated to Bangla. An expert panel with 6 members, including the author, three psychologists (university faculties who were experienced in personality psychology), one linguist from the Linguistics department, and one university faculty from the English department were asked to evaluate the possible degree of equivalence between the original constructs and what could be obtained in Bangladesh and also about possible overlaps. Based on the information from FGD, the expert panel assessed the qualitative issues relevant to the scale. In this qualitative phase, the expert panel assessed the linguistic and cultural differences between the original language and target language of the scale.

A translation of the scale into Bangla was completed by two translators (one was a psychologist and the other was the author of this manuscript). They were native Bangla speakers who had knowledge of assessment principles and had in-depth knowledge of their

native Bengali culture. They also evaluated the cultural equivalence of items. The forward translated form of the scale was then judged by the expert panel to know whether there are any differences in the two language versions. A back translation of the scale (i.e., translating items from Bangla to the original English) was completed by two language experts (one was a linguist and the other was a faculty in English). The expert panel further judged the back translated form of the scale, suggesting that the translation was an appropriate version of the original English scale. After judging the two translations, the expert panel finalized the TIPI-B. The TIPI-B was then compared with the original English scale. At first the original TIPI was administered to 25 respondents who had enough knowledge of both Bangla and English languages. A week later, the TIPI-B was administered to 20 respondents (the respondents who were participating in the original TIPI study). A significant positive correlation ($r = .954, p < .01$) between two versions of the scale indicated that the TIPI-B was an appropriate translated version of the original TIPI.

Bangla Big-Five Inventory (BFI-44-B). The BFI-44-B is a 5-point Likert-type scale (Muhammad, Semul, & Sultana, 2015) originally developed by Goldberg (1993). It was used to explore the convergent validity of the TIPI-B. The BFI-44-B has five personality dimensions: Extraversion (8 items), Neuroticism (8 items), Agreeableness (9 items), Conscientiousness (9 items), and Openness (10 items). Responses are given the weights of 1 for *strongly disagree*, 2 for *disagree a little*, 3 for *neither agree nor disagree*, 4 for *agree a little*, and 5 for *strongly agree*. There are reverse scores for 16 items. Muhammad et al. (2015) found significant correlations ($r(\text{open}) = .93, p < .01$; $r(\text{cons}) = .83, p < .01$; $r(\text{extra}) = .82, p < .01$; $r(\text{agree}) = .91, p < .01$; $r(\text{neuro}) = .86, p < .01$) between English and Bangla version of the BFI-44, indicating the translation reliabilities of the scale. A significant test-retest reliability of the scale ($r(\text{open}) = .87, p < .01$; $r(\text{cons}) = .82, p < .01$; $r(\text{extra}) = .90, p < .01$; $r(\text{agree}) = .86, p < .01$; $r(\text{neuro}) = .92, p < .01$) was also found in this BFI-44-B. The content validity of the scale was assessed by the subject matter expert's essential remarks, reviews, and suggestions on the scale. The construct validity of the scale was measured by performing the correlations ($r(\text{open}) = .94, p < .01$; $r(\text{cons}) = .86, p < .01$; $r(\text{extra}) = .84, p < .01$; $r(\text{agree}) = .79, p < .01$; $r(\text{neuro}) = .92, p < .01$) between dimensions' and total scale scores.

Procedure

Data were collected from different regions of the Chittagong division, Bangladesh. At first, respondents were provided an informed consent form that contained clarifications about the purpose of the study and assuring that the highest confidentiality would be maintained throughout the whole research process. After obtaining the consent from the participants, respondents were provided a set of questionnaires (two personality scales along with a personal information form) to each of the 662 respondents individually. Respondents who did not understand the questionnaire properly were given necessary explanations. They were requested to read each statement carefully and express their feelings by putting a tick mark (✓) on one of the five alternatives. They were asked to give their responses honestly. They were also provided a return envelope so that they can return their answers with the highest confidentiality. Moreover, they were assured that there were no options in the questionnaires to mention their name or other personal information or contact address. At the end, they were warmly thanked for their active cooperation.

Results

Exploratory Factor Analysis

An exploratory factor analysis (EFA) was performed with the subsample 1 ($n = 330$) by using principal axis factoring with the direct oblimin rotation method. Based on the eigenvalues greater than 1, a three-factor structure was

found in the TIPI-B, explaining 62.64% of the total variance. This structure had shown the loadings of 4 items (2, 3, 7, and 8) on the factor 1, 4 items (1, 6, 5, and 10) on the factor 2, and 2 items (4 and 9) on the factor 3. A Horn's parallel analysis was also performed to decide about the number of factors to be extracted. A simulated data set through a syntax written in SPSS was made for performing this analysis. The two data sets (actual and simulated) were then run in SPSS with some specifications: principal axis factoring extraction, 1000 iteration numbers, and random data generation method. The parallel analysis also confirmed three factors in the TIPI-B. The eigenvalues of the first three factors in the actual data set were higher than that of the first three factors in the simulated data set, indicating three factors of the scale.

Since the Big Five personality model was the background of our present scale, a second EFA was conducted to test for a five-factor structure. Though the principal axis factoring and the direct oblimin rotation method were used in the second EFA, we specified that five factors are to be extracted. The obtained five-factor structure explained 77.53% of the total variance (Table 2). The second EFA extracted 4 items (2, 3, 7, and 8) on the factor 1, 2 items (1 and 10) on the factor 2, 2 items (4 and 9) on the factor 3, 1 item (6) on the factor 4, and 1 item (5) on the factor 5. To see whether the sample was appropriate to EFA, the KMO (Kaiser-Meyer-Olkin) and Bartlett's test of sphericity were estimated. The observed KMO .838 was greater than the recommended KMO .600 (Tabachnick & Fidell, 2013), indicates that the data was sufficiently adequate for the factor analysis. The Bartlett's test of sphericity was also significant ($\chi^2 = 1946.515$, $df = 45$, $p < .01$), indicating that there were sufficient correlations among the variables in factor analysis.

Table 2

Five-Factor Structure of the Bangla Version of Ten Item Personality Inventory through EFA (n = 330)

Items	Dim.	Com.	F1	F2	F3	F4	F5	<i>M</i>	<i>SD</i>
3. Sympathetic, warm	3	.51	.86					3.73	1.12
2. Reserved, quiet	2	.44	.73					3.66	1.19
7. Calm, emotionally stable	2	.42	.63				.13	3.65	1.05
8. Anxious, easily upset	3	.39	.41	.12			.20	3.38	1.16
10. Conventional, uncreative	5	.36		.84				3.48	1.12
1. Extraverted, enthusiastic	1	.42	.18	.56				3.39	1.21
4. Critical, quarrelsome	5	.30			.78			2.94	1.11
9. Open to new exp., complex	4	.31			.62			3.31	1.10
6. Disorganized, careless	4	.29				.60	.12	3.31	1.11
5. Dependable, self-disciplined	1	.22				.14	.54	3.57	1.13
Eigenvalues			3.909	1.201	1.154	.850	.639		
Percentage of explained variance			39.09	12.01	11.54	8.50	6.39		
Total percentage of explained variance			77.53						

Note. Extraction Method: Principal Axis Factoring; Rotation Method: Direct Oblimin with Kaiser Normalization.

F1 = Factor 1; F2 = Factor 2; F3 = Factor 3; F4 = Factor 4; F5 = Factor 5; Dim = Dimensions (1 = Extraversion, 2 = Agreeableness; 3 = Conscientiousness; 4 = Neuroticism; 5 = Openness); Com = Communalities.

Confirmatory Factor Analysis

Since we found a three-factor structure of the scale through both EFA and parallel analysis, we decided to perform a confirmatory factor analysis (CFA) at first to test whether this structure fits the scale. The second subsample ($n = 332$) was used in the first CFA. Adequacy of model fit was assessed by multiple fit indices, including chi-square (χ^2), ratio of chi-square and DF (χ^2/df), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), Tucker-Lewis index (TLI), standard root mean square residuals (SRMR), and root mean square error of approximation (RMSEA). The following cut-off values for model fit indices were considered: χ^2 with $p \geq .01$, $\chi^2/df \leq 5$, GFI $\geq .95$, AGFI $\geq .90$, CFI $\geq .90$, TLI $\geq .95$, and SRMR and RMSEA $\leq .08$ (Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger, & Muller, 2003). An acceptable model fit summary was found for the first CFA model (Figure 1). Though we found an acceptable model fit summary for the three-factor CFA model, it was not our target goal to establish a three-factor structure of the scale. Since the TIPI was a proven personality instrument (Gosling et al., 2003) used worldwide with its original five-factor structure, our TIPI-B should also have five-factor structure. A five-factor CFA model was then conducted in order to examine a possible five-factor structure of TIPI-B. A good and acceptable model fit summary was estimated in the five-factor CFA model (Figure 1).

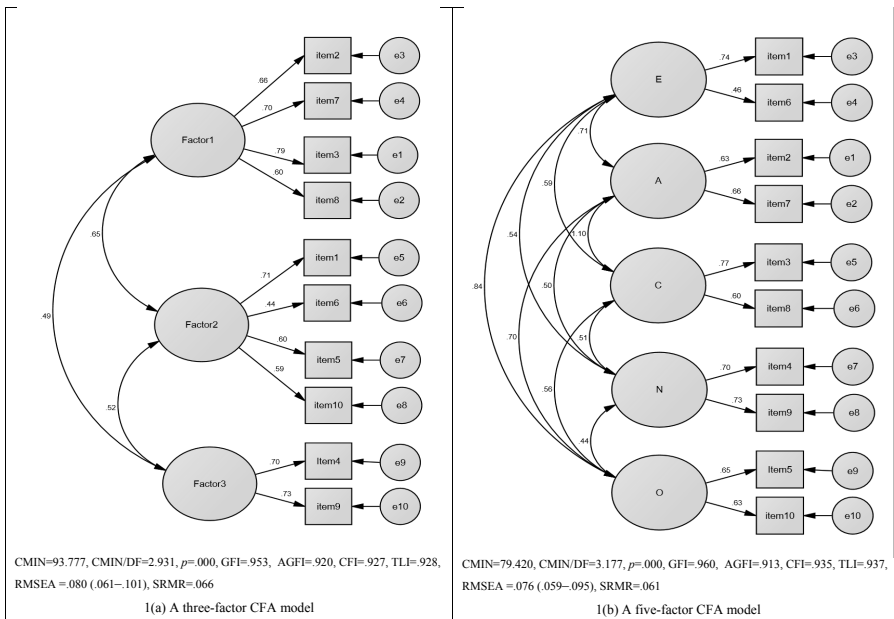


Figure 1. Two CFA models of the TIPI-B.

Note. CMIN = Chi-square minimum; CMIN/DF = Ratio of chi-square minimum and DF; GFI = Goodness of fit index; AGFI = Adjusted goodness of fit index; CFI = Comparative fit index; TLI = Tucker-Lewis index; SRMR = Standard root mean square residuals; RMSEA = Root mean square error of approximation; E = Extraversion; A = Agreeableness; C = Conscientiousness; N = Neuroticism; O = Openness.

Reliability Analysis

The internal consistency of the scale was examined to assess the reliability of the scale (Table 3). Usually, the higher the Cronbach alpha the more reliable the generated scale is (Reynaldo & Santos, 1999). An Alpha greater than .800 indicates a good internal consistency and greater than .700 indicates an acceptable internal consistency (George & Mallery, 2003; Nunnally & Bernstein, 1994). Many researchers claim that a Cronbach alpha is inappropriate and meaningless in a two-item scale. Instead, they recommend Pearson correlations as measures of reliability (Eisinga, Grotenhuis, & Pelzer, 2013). So, a correlation coefficient between two items in each dimension was calculated to assess scale reliability (Table 4). All of the five correlations were significant. Each individual item of the scale was positively correlated with each of the five dimensions of the scale (Table 5).

Test-retest reliability was performed to know whether the test results are consistent over time. The first testing session was conducted on 330 respondents. Of them, 50 respondents were selected for the second testing session (retest) over a two-week period. A significant correlation was found between two TIPI-B scores at two different testing sessions, indicating the scale's same outcomes over times (Table 3).

Table 3

Internal Consistency of the Subscales of TIPI-B and Test-Retest Reliability between Testing Session I (n = 330) and Testing Session II (n = 50)

Subscales of TIPI-B	<i>M</i>	<i>SD</i>	Cronbach alpha (α)	Test-retest reliability (<i>r</i>)
Extraversion	3.35	1.16	.51	.72**
Agreeableness	3.66	1.12	.59	.82**
Conscientiousness	3.55	1.13	.63	.76**
Neuroticism	3.13	1.10	.67	.54**
Openness	3.53	1.12	.58	.83**

Note. **Correlation is significant at .01 levels.

Table 4

Correlations between the 10 TIPI-B Items

TIPI-B items under five dimensions	TIPI-B items									
	1	2	3	4	5	6	7	8	9	10
Extraversion										
1. Extraverted, enthusiastic	--									
2. Reserved, quiet	-.34**	--								
Agreeableness										
3. Sympathetic, warm	.41**	-.21**	--							
4. Critical, quarrelsome	-.39**	.25**	-.50**	--						
Conscientiousness										
5. Dependable, self-disciplined	.38**	-.21**	.61**	-.58**	--					
6. Disorganized, careless	-.33**	.04	-.41**	.44**	-.49**	--				
Neuroticism										
7. Calm, emotionally stable	.24**	-.26**	-.26**	-.27**	.27**	-.37**	--			
8. Anxious, easily upset	-.23**	.24**	-.11*	.28**	-.23**	.34**	-.48**	--		
Openness										
9. Open to new exp., complex	.42**	-.11*	-.34**	-.29**	-.33**	.24**	.15*	-.19**	--	
10. Conventional, uncreative	-.53**	.27**	-.27**	-.30**	.27**	-.28**	-.18**	-.20**	-.46**	--

Note. *N* = 662. Correlations between positively and negatively keyed TIPI-B items for the same dimension are shown in bold typeface.

p* < .05; *p* < .01.

Table 5
Correlations between TIPI-B's Individual Item Scores and its Subscales Scores

TIPI-B items	TIPI-B Subscales				
	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
1. Extraverted, enthusiastic (E)	.83**	.46**	.41**	.26**	.56**
2. Reserved, quiet (E)	.81**	.26**	.14**	.29**	.28**
3. Sympathetic, warm (A)	.38**	.89**	.59**	.26**	.36**
4. Critical, quarrelsome (A)	.39**	.84**	.59**	.32**	.35**
5. Dependable, self-disciplined (C)	.37**	.69**	.86**	.29**	.35**
6. Disorganized, careless (C)	.23**	.49**	.87**	.41**	.29**
7. Calm, emotionally stable (N)	.31**	.31**	.37**	.87**	.25**
8. Anxious, easily upset (N)	.29**	.27**	.33**	.85**	.23**
9. Open to new exp., complex (O)	.39**	.37**	.33**	.26**	.85**
10. Conventional, uncreative (O)	.49**	.33**	.31**	.22**	.86**

Note. E = Extraversion; A = Agreeableness; C = Conscientiousness; N = Neuroticism; O = Openness; N = 662; ** $p < .01$.

Validity Analysis

Content validity of the scale was assessed by an expert panel's review, comments, suggestions, and judgements. The expert panel gave their essential remarks in regards to the item's meaning, item's complexity, and comprehensibility of words using during the whole translation process of the scale. They suggested that the TIPI-B was a personality measure that represented all five facets of Big Five personality scale.

Convergent validity of the scale was assessed by computing correlations between two Bangla version scales, the TIPI-B and the BFI-44-B. The convergent validities of the TIPI-B are shown in the diagonal of Table 6. The convergent correlations (mean, $r = .788$) markedly exceeded the discriminant correlations (absolute mean, $r = .213$). None of the discriminant correlations exceeded the value .315. Thus, the convergent and discriminant validities of the scale were established.

Table 6
Convergent Correlations between TIPI-B and BFI-44-B

TIPI-B	BFI-44-B				
	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Extraversion	.83**	.26**	.21**	.32**	.26**
Agreeableness	.08*	.76**	.24**	.29**	.10*
Conscientiousness	.16**	.21**	.79**	.22**	.10*
Neuroticism	.28**	.32**	.23**	.80**	.16**
Openness	.27**	.20**	.13**	.29**	.75**

Note. N = 662, * $p < .05$; ** $p < .01$.

Convergent correlations are shown in bold typeface on the diagonal. Discriminant correlations are shown below the diagonal for the TIPI-B and above the diagonal for the BFI-44-B.

Invariance Analysis

Multi-group CFA was conducted to examine the measurement invariance of the scale across genders. Five comparison models (e.g., configural, measurement weights, measurement intercepts, measurement residuals, and structural covariances) were considered in this invariance test. The fit indices (e.g., Chi-square, CFI, RMSEA) of each model remained virtually unchanged in terms of the fit indices of another model, indicates that there is no untenable invariance between two fit indices (Table 7). We compared the differences in model fit and used the following differences to indicate lack of measurement invariance $\Delta\text{CFI} \geq .01$ and $\Delta\text{RMSEA} \geq .015$ (Chen, 2007). The configural model (M1) had adequate fit indices; indicating the same TIPI-B structure in two gender groups. Taking all the findings into consideration, the four models (M2 through M5) demonstrated no meaningful decreases in model fits. Though the difference in CFI values (.014) between the first (M1) and last model (M5) was a little bit higher than the threshold value, however it was not significantly higher than the threshold value. Thus, we can conclude that the five-factor structure of TIPI-B was invariant across genders.

Table 7
Test of Measurement Invariance in TIPI-B by Gender

Model	Model fit					Model comparison		
	χ^2	df	χ^2/df	CFI	RMSEA [90% CI]	Models	ΔCFI	ΔRMSEA
Configural (M1)	154.69	50	3.09	.945	.056 [.046–.067]			
Measurements weights (M2)	159.56	55	2.90	.945	.054 [.044–.063]	M2–M1	.000	-.002
Measurements intercepts (M3)	171.82	65	2.64	.944	.050 [.041–.059]	M3–M2	-.001	-.004
Measurements residuals (M4)	190.36	75	2.54	.939	.048 [.040–.057]	M4–M3	-.005	-.002
Structural covariances (M5)	210.82	80	2.64	.931	.050 [.042–.058]	M5–M4	-.008	.002

Discussion

The TIPI is an established personality measurement scale used around the world. Although the TIPI has a good research history on its psychometric properties and has empirically been validated through different multivariate statistics over the world, however it has not been studied and validated in Bangladesh before. The present study was aimed to translate and validate this scale into Bangla.

Test adaptation guidelines provided by ITC were followed in the translation process of TIPI-B. There are ample studies on the translation and adaptation process of TIPI as well as the measure of its factor structure (Atak, 2013; Muck

et al., 2007; Romero et al., 2012). The main goal of the TIPI-B was to create a short measure with a perfect factor structure that optimized the content validity of the scale. The first EFA result revealed a three-factor structure of the TIPI-B. This is not unlike some other studies in which researchers obtained a poor factor structure of TIPI. For example, Tatalovic Vorkapic (2016) found a four-factor structure of the TIPI instead of its five-factor structure by EFA. It is almost impossible to get the original five-factor structure of TIPI because it measures five broad dimensions with only two items for each dimension. A two-item factor rarely shows its good factor structure, as we need at least three items to define a factor properly in factor analysis. Researchers have suggested three to five items for representing each factor in factor analysis (MacCallum, Widaman, Zhang, & Hong, 1999; Raubenheimer, 2004). That is a probable reason why we did not obtain the original five-factor structure in the TIPI-B.

Since the TIPI is a well-established personality measurement scale with its five broad dimensions, our target goal was to reproduce its five dimensions. So a five-factor structure of TIPI-B was specified and assessed through CFA. The CFA results showed a good five-factor model of TIPI-B with two items for each factor.

In respect to the subscales of the scale, the TIPI-B had no good internal consistency reliability. This result was opposite with the past findings (e.g., Atak, 2013) in which the author found good internal consistency for the Turkish version of the TIPI (Openness to Experiences .83, Agreeableness .81, Emotional Stability .83, Conscientiousness .84, and Extraversion .86). The scale reached excellent levels of test-retest reliability over a two-week period which was supported by the original study (Gosling et al., 2003) as well as by the other studies (Oshio et al., 2013; Rammstedt & John, 2007; Renau et al., 2013; Romero et al., 2012). Significant correlations with the other standard Bangla personality scale (BFI-44-B) indicated the scale's adequate convergent validity. This result was supported by the original study (Gosling et al., 2003) as well as by the other past findings (Atak, 2013; Muck et al., 2007; Oshio et al., 2012; Romero et al., 2012). Discriminant validity of the scale was also established which was in accordance with some studies (Akhtar, 2018; Gosling et al., 2003). Though the CFA models of both of three and five-factor structure showed acceptable fit indices, however, it would be best valid in terms of five-factor structure. Because the five-factor structure was based on the established two personality models.

Some limitations should be addressed in the study. First, it solely relied on a self-report measure to test for convergent validity and did not consider any other measures relevant to the measured constructs such as interview, observation, etc. Future studies might incorporate this issue, so that the validity of the scale can be further substantiated. Second, instead of a probability sampling method, a non-probability purposive sampling method was followed. Third, the demographic characteristics were not controlled perfectly in the study. That's why there were some differences among different levels of demographics observed in the study. Against the above mentioned limitations, the study had some strength. A good sample size and high response rate did credit to accurate findings in the study. The notable strength of this study was that it went through an extensive validation process with all important psychometric properties.

Conclusions

Though the present study had showed a poor five-factor structure of TIPI-B by EFA, it demonstrated a stable five-factor structure by CFA. Moreover, various other procedures employed in the study supported both reliability and validity of the Bangla version of the scale. We recommend its use to measure the personality of Bangladeshi people when quick assessment is required.

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Model Velikih Pet u Bangladešu: ispitivanje Desetoajtemskog inventara ličnosti

Nurul Islam

Department of Psychology, University of Chittagong, Bangladesh

Istraživači širom sveta vrlo često konstruišu vrlo kratke mere Velikih pet dimenzija ličnosti, kako bi mogli da rade brzu procenu ličnosti. Verovatno najpoznatiji od svih kratkih instrumenata za procenu ličnosti je Destoajtemski inventar ličnosti (eng. the Ten-Item Personality Inventory – TIPI). Cilj ove studije je da se izvrši prevod, adaptacija i validacija TIPI-ja u bangladeškoj kulturi. Nakon završetka procedure prevođenja, bengalska verzija (na bengalskom odnosno bangla jeziku, prim. prev.) TIPI-B-a je proverena na uzorku od 662 odrasla stanovnika Bangladeša. Eksplorativnom faktorskom analizom na prvoj polovini uzorka ($n = 330$) je objašnjeno 77.53% ukupne varijanse, međutim, nije potvrđena petofaktorska struktura sa po dva ajtema u okviru svake skale. Prihvatljivi indeksi uklapanja podataka u model ($\chi^2/df = 3.177$, GFI = .960, CFI = .935, TLI = .937, SRMR = .061 i RMSEA = .76) dobijeni su u postupku konfirmativne faktorske analize na drugoj polovini uzorka ($n = 332$). Prihvatljive mere interne konzistencije, test-retest pouzdanosti i konvergentne i diskriminativne validnosti skale su utvrđene različitim statističkim analizama. Shodno tome, TIPI-B sa svojih pet dimenzija se može koristiti kao validna i pouzdana mera za procenu ličnosti stanovnika Bangladeša.

Ključne reči: Big Five, TIPI, EFA, CFA, validnost, Bangladeš.

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