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Reliability and Validity of the 10-Item Personality Inventory among Older Iranians

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Background: The high interest in short scales to measure personality traits has created a need for psychometric studies to validate such scales in different languages and cultures. There has recently been increasing interest in the study of personality in late life.

Objective: The aim of this study was to investigate the reliability and validity of the Persian version of the Ten-Item Personality Inventory (TIPI) among older Iranians.

Design: In this cross-sectional, psychometric study, 160 individuals older than 60 years were selected using multi-stage and convenience sampling methods. Data were collected using the Ten-Item Personality Inventory (TIPI) and the NEO Five-Factor Inventory (NEO.FFI). The face, content, and convergent validity of the TIPI were examined, and its reliability was evaluated using Cronbach's alpha coefficient and test-retest reliability.

Results: In general, the Persian version of the TIPI had acceptable psychometric properties for measuring the Big Five personality traits in older adults in terms of test-retest reliability (ICC = .92, p = .000) and convergent validity (r = .411, p < .00).

Conclusion: The results of this study demonstrate that the TIPI is a valid and reliable tool for measuring the Big Five personality traits.

Key words: 10-Item Personality Inventory (TIPI), Iranian, older adults, psychometric

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Introduction

The global population is undergoing a quiet revolution, as there are now almost 600 million older adults in the world, and this number is expected to double by 2025 and reach 2.0 billion by 2050 (WHO, 2015). In Iran, people over the age of 60 years comprise approximately 7.5 million (9.3%) of the population according to the latest statistics (Statistical Center of Iran, 2016). However, the growing aging population is a major challenge for communities due to specific problems related to old age (Nasiri, Foroughan, Rashedi, & Shahbazi, 2016). These include cognitive impairments such as Alzheimer's disease, changes in bodily response to medication, important life events (such as retirement), moving to a nursing home, declining income, low social contacts, and loneliness (WHO, 2015). All of these factors can affect the personality and, consequently, the health status of older adults (Niclasen, Lund, Obel, & Larsen, 2018; WHO, 2015).

There are two different perspectives regarding the stability of personality traits in old age. The first view is that personality changes continue to happen up until the third decade of life, but the amount of change decreases later to a great extent (Costa & McCrae, 1988). The second view believes that personality changes continue to occur throughout the human life span (Debast et al., 2014). Older adults may experience personality changes through basic learning processes (for example, contact and environmental contingencies and observational learning) as well as experiencing fundamental changes in different domains of their lives (for example, marriage and occupation) (Smith & Spiro III, 2002). For instance, among the Big Five personality traits, neuroticism, extraversion, and openness to experience decline with age, while agreeableness and conscientiousness increase with age (Debast et al., 2014). Studies have also demonstrated the significant role of personality traits in differentiating between healthy older adults and those in the early stages of Alzheimer's disease, and personality has been found to be a better predictor of Alzheimer's disease than cognitive changes (Duchek, Balota, Storandt, & Larsen, 2007).

Although different definitions and categorizations have been provided for personality and its constituents, most scholars have adapted and developed the definition offered by Allport (Allport, 1961): "Personality is a dynamic structure within the person consisting of psychosocial-physical systems determining their characteristic behaviors and thoughts." Based on this definition, several tools have been designed for personality evaluation. The TIPI is one of the tools used to measure the components of personality in different societies (Gosling, Rentfrow, & Swann, 2003). It assesses the Big Five personality factors. The psychometric properties of the original version of the TIPI were analyzed in a sample of 1813 students, and internal consistency estimates were found to be above .55 for all of its subscales. Cronbach's alpha coefficients were also found in the range of .40-.73 (Gosling et al., 2003).

Studies (Ehrhart et al., 2009; Hofmans, Kuppens, & Allik, 2008; Łaguna, Bąk, Purc, Mielniczuk, & Oleś, 2014; Muck, Hell, & Gosling, 2007; Romero, Villar, Gómez-Fraguela, & López-Romero, 2012) conducted to examine the psychometric properties of the TIPI have reported differences and similarities in the psychometric indices; a study on the psychometric properties of the Spanish version of

the TIPI (Romero et al., 2012) revealed a Cronbach's alpha of .50 and alphas in the range of .38-.59 for the whole inventory and its subscales, respectively. Cronbach's alpha of .57 was also reported for the original version of the inventory (Ehrhart et al., 2009). In addition, the TIPI subscales have shown varying test-retest reliabilities in different studies. For example, extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience earned the highest test-retest reliability estimates (with an average of .72) in the Spanish version (Romero et al., 2012), whereas in the original version, emotional stability and agreeableness had the highest (.68) and the lowest (.38) test-retest reliability estimates, respectively (Ehrhart et al., 2009). In a recent study (Łaguna et al., 2014) on the Polish version of the TIPI, as in the original version and the other versions, the TIPI was found to have a relatively low internal consistency. Given that most personality-related constructs are culture-bound, it is essential to examine personality scales in different cultures. In addition, personality scales should be analyzed with advanced statistical and psychometric methods to obtain sufficient trust and confidence in the reliability and validity of their respective measurements (Cheung, van de Vijver, & Leong, 2011).

Considering the fact that the TIPI is a widely used instrument in research and clinical settings, its validated Persian version can be used in educational and clinical centers to assess personality traits among older adults so their different needs can be better addressed (Łaguna et al., 2014). It should also be noted that although numerous tools have been validated for assessing the Big Five personality traits- for example, the 60-Item NEO Five-Factor Inventory (NEO.FFI) (Anisi J., Fathi-Ashtiani A., Soltani Nejad A., & Amiri M., 2006), the 106-item revised version of the Eysenck Personality Questionnaire (EPQ) (Kaviani, Pournasseh, & Mousavi, 2005), and its short version (Bakhshipour & Khorooshahi, 2006) — only two valid instruments can be used with older adults, including the Personality Assessment Inventory (PAI) (344 items) (Morey, 2015) and the Revised NEO Personality Inventory (NEO-PI-R) (344 items) (Costa & McCrae, 2008). Moreover, all of the mentioned tools are relatively long and take time to complete. But the TIPI evaluates personality using only 10 items, requiring just one minute to complete. Therefore, it is a very suitable tool for use with older adults. The present study aimed at validating the Persian version of the TIPI among older Iranians.

Methods

Participants

The statistical population consisted of individuals older than 60 years in Tehran. Using multi-stage and convenience sampling methods, a total of 160 older adults, including two groups of community-residing older adults (n = 118) and those living at nursing homes (n = 42), were selected as the study sample. The inclusion criteria were as follows: age older than 60 years, communicability, and lack of cognitive problems (based on the Abbreviated Mental Test, AMT). Incomplete questionnaires were excluded from the study. The present study was reviewed and approved by the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

Procedure

Questionnaires

The 10-Item Personality Inventory (TIPI) is a self-reported general scale designed to assess the Big Five personality traits including extraversion (E), agreeableness (A), conscientiousness (C), emotional stability (ES), and openness (O). The short form was designed and validated in the US in 2003. Each of the 10 items consists of two descriptors, and each Big Five personality trait is measured by two items. The items in the TIPI are rated on a 7-point Likert-type scale ranging from 1 (disagree strongly) to 7 (agree strongly), and the total personality score (10-70) is obtained by summing the subscale scores. The TIPI takes approximately 1 minute to complete (Gosling et al., 2003). It has quickly become popular, but its psychometric properties have not been adequately examined (Romero et al., 2012). Studies conducted on the psychometric properties of the TIPI demonstrated its proper psychometric properties in terms of test-retest reliability, convergent and divergent validity, factor structure, and correlation with other Big Five personality trait tools (Ehrhart et al., 2009; Gosling et al., 2003; Hofmans et al., 2008; Łaguna et al., 2014; Muck et al., 2007; Romero et al., 2012). In addition to the original version (Gosling et al., 2003), the psychometric properties of the TIPI have also been examined in Spain (14), Belgium (Hofmans et al., 2008), Germany (Muck et al., 2007), the US (Ehrhart et al., 2009), and Poland (Łaguna et al., 2014).

The NEO Five-Factor Inventory (NEO.FFI). The NEO.FFI was developed (Costa & MacCrae, 1992) as a short measure of the Big Five personality traits. The personality traits measured by the NEO PI-R, include neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C). Convergent and discriminant validity estimates indicate that the short form measures the Big Five personality traits with less accuracy than the long form. The test-retest reliability of the NEO.FFI's subscales ranged from .86 to .90, and their internal consistency varied from .74 to .89 (Anisi, Majdiyan, Joshanloo, & Ghoharikamel, 2011).

The Abbreviated Mental Test (AMT): This test has 10 questions designed to assess orientation, focus/attention, short- and long-term memory, and screening cognitive impairment, including dementia and delirium in older adults. The validity and reliability of the AMT has also been verified in Iran (Foroughan et al., 2017).

Preparation of tools

The following steps were taken to prepare the Persian version of TIPI: (1) acquiring the translation permit from the original authors (Gosling et al., 2003); (2) advanced translation (English to Persian) by two Persian-speaking translators (translators 1 and 2) who were proficient in English translation with a history of inventory translation but were not familiar with the TIPI; (3) after the completion of the translation stage, the differences between the translations were reviewed and documented in a meeting with the researchers and translators, and a final

translation was prepared from the inventory; (4) translators 3 and 4, who were English-speaking and familiar with Persian, translated back the basic translation into English conceptually, and modified the items that seemed to be controversial and not consistent with the original version; and (5) After translation, 10 experts with experience in geriatrics, counseling, and Persian literature and 15 older adults who were interested in giving their opinions were recruited to examine the face and content validity.

The face validity was verified by qualitative and quantitative methods. In the qualitative process, the 10 experts and 15 older adults provided their opinions on the level of difficulty, appropriateness, and clarity of the items; modifications were applied accordingly. The quantitative process involved the use of the item impact method to determine the impact score. For this process, a 5-point Likert-type scale ranging from 1 (strongly important) to 5 (strongly unimportant) was used. If an item's impact was greater than the desired level based on the following formula "item impact = importance x frequency (%)," the item was maintained in the list of items. In this research, the estimated score was more than 1.5 (Broder, McGrath, & Cisneros, 2007) for all of the items, so they were all preserved. The content validity was evaluated using the content validity ratio (CVR). In Lawshe's method (Lawshe, 1975) , each item is evaluated by experts as "necessary," "useful but not necessary," or "unnecessary." The CVR for each question is then calculated according to the following formula:

$$CVR = \frac{Ne - \frac{N}{2}}{\frac{N}{2}}$$

The acceptable value for each item varies depending on the number of experts determining the content validity. According to Lawshe's method, the minimum acceptable value based on the opinions of 10 experts is .62 (Lawshe, 1975). In the present study, the content validity ratio was higher than .62 for all of the items.

Before administering the questionnaires, the participants' verbal and written consent was acquired. The research questionnaires (the TIPI and the NEO.FFI) were administered using interviews, and the required data were obtained. After two weeks, the TIPI was completed by the older adults for the second time. The study data were analyzed using descriptive statistics (frequency, mean, standard deviation, and percentage), Pearson's correlation coefficient to assess convergent validity, the intraclass correlation coefficient (ICC) to assess the test-retest reliability, and Cronbach's alpha coefficient to evaluate the internal consistency. All of the analyses were performed using SPSS software (version 21).

Results

Among the 160 participants, 74% were community-residing older adults, 34% were between the ages of 66-71 years, 57% were males, 86% were married, approximately 42% (n = 67) were self-employed before retirement, and 33% (n = 53) had middle school educations (see *Table 1*).

Table 1

Descriptive characteristics of the study participants

Variable	Categories	N	Percent	Cumulative percentage
Age	60–65	54	33.8	33.8
	66–71	56	34.1	68.8
	72–77	21	13.1	81.9
	78–83	29	18.1	100
Education	Illiterate	37	23.3	23.3
	Secondary	53	33.1	56.3
	Diploma	42	26.3	82.5
	Bachelor	20	12.5	95
	Master and higher	3	1.9	100
Occupation	Housekeeping	30	18.8	18.8
	Self-employed	67	41.9	60.6
	Employee	47	28.8	89.4
	Military	17	10.6	100
Marital Status	Married	138	86.3	86.3
	Widowed	22	13.8	100
Gender	Men	91	56/9	56.9
	Women	69	43.1	100
Residence	Community residing	118	73.75	73.75
	Nursing homes	42	26.25	100

Note: N = 160

Table 2

Cronbach's alpha coefficients of the TIPI

	Scale if item deleted			
Item	**Mean**	**Variance**	**Item-total correlation**	**Alpha**
1	43.16	34.85	0.237	0.47
2	45.80	46.18	0.059	0.60
3	42.95	36.29	0.575	0.41
4	42.58	36.15	0.243	0.47
5	44.02	33.19	0.455	0.40
6	44.53	33.50	0.331	0.44
7	42.95	36.57	0.498	0.42
8	43.67	35.80	0.245	0.47
9	43.41	40.15	0.181	0.49
10	45.20	44.45	0.098	0.56

Cronbach's alpha of .51 was found for the TIPI, and alphas in the range of .40–.60 were found for its subscales. As shown in *Table 2*, item 2 had the lowest correlation with the TIPI, and its removal increased the internal consistency to 0.60 (see Table 2). Cronbach's alpha for each of the subscales is presented separately in *Table 3*.

Table 3

Convergent validity of the TIPI and its subscales

Variable	Mean (SD)	TIPI-TOT	TIPI-E	TIPI-ES	TIPI-A	TIPI-C	TIPI-O
TIPI-TOT	49.03 (6.64)	1					
TIPI-E	9.37 (3.34)	.614**	1				
TIPI-ES	10.06 (1.98)	.618**	.204**	1			
TIPI-A	9.21 (2.30)	.310**	–.260*	.215**	1		
TIPI-C	11.45 (2.24)	.681**	.048	.329**	.343**	1	
TIPI-O	8.92 (2.02)	.553**	.404**	.098	-.282**	.333*	1
NEO.FFI	200.66 (21.70)	.411**	.205**	.122	.364**	.358	.079
E	40.91 (7.71)	.748*	.418**	.386**	.509**	.524**	.227**
N	32.78 (7.19)	.056	-.155	.103	.371**	.137	–.234**
A	42.25 (4.84)	.293**	.177*	.048	.269*	.256*	.034
C	47.72 (7.12)	.737**	.355**	.302**	.541	.528*	.332*
O	36.13 (5.75)	.353**	.289**	.050	.092	.259**	.238**
α		.510	.690	.490	.400	.540	.450

Note: $^{*}p < .05$; $^{**}p < .01$

The NEO.FFI was also administered to the participants (see *Table 3*). The TIPI has a significant and positive relationship with each of its subscales except neuroticism, and also with the NEO.FFI (r = .411) and all of its subscales.

To determine the test-retest reliability, the TIPI was administered to 30 older adults two times with a two-week interval (see *Table 4*).

Table 4

Test-retest reliability of the TIPI and its subscales

Variable	ICC	F-value	DF1	DF2	P-value
TIPI-TOT	.92	26.40	29	29	.000
E	.94	18.38	29	29	.000
ES	.96	48.71	29	29	.000
A	.91	22.32	29	29	.000
C	.84	12.12	29	29	.000
O	.94	32.54	29	29	.000

Discussion

The purpose of this study was to investigate the validity and reliability of the Persian version of the TIPI for measuring the Big Five personality traits among older Iranians. The TIPI has a small number of items (10 items) and requires only one minute to complete; therefore, it does not lead to fatigue and frustration in the respondents. The ease of use of the TIPI due to its features, along with an increasing research interest in the validation and translation of this tool, were the incentives to validate it among older Iranians. In this study, the TIPI was investigated in terms of validity (face, content, and convergent) and reliability (internal consistency and test-retest). The results showed that the TIPI is an appropriate tool for personality studies in older adults.

In the present study, the TIPI was properly translated from the original language into Persian and assessed in terms of the face and content validity. In addition to the face and content validity, convergent validity was established by correlating the TIPI with the NEO.FFI; the correlation coefficients indicated acceptable convergence validity for the TIPI. This finding is consistent with those of various studies conducted in the US (Ehrhart et al., 2009; Gosling et al., 2003), Belgium (Hofmans et al., 2008), Germany (Muck et al., 2007), Spain (Romero et al., 2012), and Poland (Łaguna et al., 2014).

Despite a significant relationship between the total correlation coefficients of the TIPI and the NEO.FFI ($r = .411$), there are deficiencies in some of the correlation coefficients of the scales that should be considered. For example, there is no significant relationship between the Emotional Stability scale in the TIPI with the Neuroticism scale in the NEO.FFI. Also, the correlation coefficient in the Openness to Experience scale is relatively low ($r = .238$). Regarding the low correlation coefficient of the Openness to Experience scale, it can be said that this scale has a low correlation coefficient in other similar studies (Łaguna et al., 2014). The authors argue that Openness to Experience is psychometrically considered as one of the most problematic dimensions (Romero et al., 2012). But there may be several reasons for the insignificance of the Emotional Stability scale, including cultural differences, types of participants (older adults), or other reasons requiring further investigation. The reliability was examined using the test-retest and internal consistency methods. A test-retest reliability coefficient of .92 (for the total TIPI) was obtained within a two-week interval, which is relatively acceptable. Similar values were found in other studies (Gosling et al., 2003; Łaguna et al., 2014; Romero et al., 2012). The reliability coefficients found for the TIPI in this study and in others indicate that this tool remains sufficiently consistent over time, resulting in almost the same results at different times and in various cultures (Hofmans et al., 2008). Cronbach's alpha of .51 was found for the TIPI, indicating its relatively low internal consistency.

A major limitation of the TIPI is its low internal consistency, which was also observed in similar studies, reporting alphas of .55 (Gosling et al., 2003), .50 (Romero et al., 2012), and .57 (Muck et al., 2007). The alpha coefficient for the TIPI is usually low, which is not surprising given that it is a brief inventory (Romero et al., 2012). Indeed, the use of the alpha coefficient for very short scales (for example, the TIPI) has been questioned by some authors (Kline, 2013). The

original developers of the TIPI (Gosling et al., 2003) stated that their inventory does not meet the effective standards of internal consistency, but they rather sought to maximize some psychometric properties, including the content validity and breadth of coverage, to cover more subscales while avoiding redundancy. Therefore, the internal consistency of the TIPI is inevitably lower than that of the traditional tools (Romero et al., 2012).

Cronbach's alpha obtained for the TIPI in the present study indicated that among the two items assessing agreeableness (items 2 and 7), item 2 (critical, quarrelsome) had the lowest correlation with the total TIPI, meaning that the removal of this item will increase the internal consistency to .60. This finding is in line with those of similar studies (Romero et al., 2012). The authors argue that among the Big Five personality traits, openness to experience is conceptually and psychometrically considered one of the most problematic dimensions (Romero et al., 2012). However, consistent with our findings, agreeableness showed the lowest correlation with the whole TIPI in previous studies (Ehrhart et al., 2009; Romero et al., 2012). This may suggest that agreeableness cannot be measured using only a few words and sentences as the TIPI does, but should be examined with more rigor and precision (Romero et al., 2012).

In addition to the low internal consistency, it should be noted that when a comprehensive personality assessment (for example, counseling assessment or in-depth diagnosis) is required, the TIPI cannot be considered an appropriate scale (Muck et al., 2007). Additionally, the TIPI is not suitable in situations in which facets have better predictive power than dimensions. Hence, more accurate and detailed evaluations are required when theoretical foundations place more emphasis on prediction through specific facets. However, the prediction of facets is not always possible (Romero et al., 2012). In such a situation, a scale with a broader coverage can be appropriate (Romero et al., 2012). In fact, the TIPI is a logical option when there is limited time for evaluation. In such a situation, the role of personality traits may be ignored or underestimated by short scales due to their relatively low reliability and lack of comprehensibility (Łaguna et al., 2014; Muck et al., 2007).

Conclusion

It can be concluded that the similarity between the coefficients found in this study and those reported by previous research indicates that the wording of the TIPI items is clear and easy to understand in both non-Persian and Persian languages and that the original version was appropriately adapted to the Iranian culture. The results also highlighted the potential of the TIPI as a tool for measuring the Big Five personality traits in older adults. However, some researchers (Muck et al., 2007) believe that it is inaccurate and misleading to say that scales such as the TIPI can substitute traditional scales of personality in all types of research. In fact, when specific facets of personality are examined, when in-depth clinical assessments are required, or when sufficient time and resources are available, it is advisable to use more comprehensive tools (Łaguna et al., 2014). Overall, the development of short and reliable personality tools can help the scientific community evaluate personality traits in different domains of psychological research and increase knowledge of individual differences (Romero et al., 2012).

Limitations

There were limitations in this study, including difficulty of access to older adults living in nursing homes. As a result, our sample was largely comprised of community-residing older adults. Therefore, caution should be taken in generalizing the study results to older adults living in nursing homes. It is recommended that the TIPI should be separately validated among this population. Similar to most studies, using self-reported questionnaires that are prone to response bias was the second limitation of the present study. We tried to minimize this bias through administering the questionnaires using interviews; nonetheless, this issue is not entirely within the control of researchers.

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