# Examining the psychometric properties and factor structure of the intellectual humility scale in Iranian adults

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## ARTICLE INFO

## ABSTRACT

**Background:** Intellectual humility, as one of the important components of personality, plays a decisive role in decision-making, learning, and social interactions. Despite its importance, there are still limited valid tools for measuring this construct across the cultural context of Iran.

**Aims:** The present study aimed to explore the psychometric properties and factor structure of the Intellectual Humility Scale of Alfano et al. (2017) among Iranian adults.

**Methods:** The study was descriptive-correlational. The statistical population included all adults in West Azerbaijan province in 2024. A sample of 573 people (19 to 72 years old) was selected using the Cochrane formula and a cluster-random sampling method. The instruments used included the Intellectual modesty Scale (Alfano et al., 2017), the Honesty-Humility subscale of the Hexagon-60 questionnaire (Ashton and Lee, 2009), Openness to Experience from the Big Five (Costa and McCrae, 1992), and the Need for Cognition Questionnaire (Cacioppo and Petty, 1982). Data analysis was undertaken using SPSS-22 and LISREL 8.80. For factor structure analysis, the sample was split into two parts; Exploratory Factor Analysis (EFA) was performed on the first part, while Confirmatory Factor Analysis (CFA) was performed on the second part.

**Results:** In the exploratory factor analysis, four factors of "open-mindedness", "intellectual humility", "corrigibility", and "engagement" were identified, which were consistent with the theoretical structure of the scale. The CFA results confirmed the favorable fit of the model (fit indices are reported). Cronbach's alpha and composite reliability coefficients were higher than 0.70 and the average variance extracted (AVE) was higher than 0.50. Also, the McDonald's omega coefficient for the dimensions was obtained between 0.71 and 0.84. The scale indicated a significant positive correlation with honesty-humility, need for cognition and openness to experience at the 0.01 level, reflecting its convergent and concurrent validity.

**Conclusion:** The findings demonstrated that the Intellectual Humility Scale has good validity and reliability across the Iranian adult community and can be used as a valid tool in psychological research. However, the limitations of the study include focusing on one province and the self-report nature of the tools. It is suggested that future studies be conducted across more diverse communities and via multimodal methods.

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## Extended Abstract

### Introduction

Humility has a long-standing place in Iranian society as one of the moral values and cultural virtues (Hassani-Rad et al., 2019). One of the emerging manifestations of this virtue in contemporary psychology is "intellectual humility," which has its roots in the epistemology of virtue, and examines the nature of right thinking as well as acceptance of one's cognitive limitations (Baher, 2011). Simply put, while the philosophical roots of intellectual humility emphasize the moral value of "recognizing one's own mental limitations and respecting the perspectives of others," personality psychology redefines this concept in a measurable and applicable way for individual behavior and attitudes, in a way that can be used in evaluation, psychological interventions, as well as cultural and social research (Alfano et al., 2017). The need to study this construct in Iranian society is considerable since Iranian culture emphasizes values such as respecting the views of others and avoiding self-importance, but a valid and indigenous tool for its measurement has not yet been provided.

The concept of intellectual humility has been defined in personality psychology and psychometric research with a variety of definitions, but these definitions overlap in key principles. Cromery-Mancuso and Russ (2016) defined intellectual humility as "a non-threatening awareness of cognitive fallibility" which involves reconsidering beliefs and respecting the perspectives of others. Meanwhile, Leary et al. (2017) emphasized the aspect of recognizing one's limitations in beliefs and reasoning processes. On the other hand, Alfano et al. (2017) described this construct as multifaceted, encompassing cognitive, affective, motivational, and behavioral dimensions, as well as emphasizing the interaction between an individual's attitude toward their own knowledge and consideration of the perspectives of others. A comparative analysis of these perspectives indicates that they all agree on the need to reconsider beliefs, accept cognitive limitations, and respect the views of others. Nevertheless, Alfano et al. (2017) provided a more comprehensive psychometric tool, considering the multifaceted nature of this construct, allowing for practical assessment and more accurate measurement of intellectual humility. Thus, the selection of Alfano et al.'s scale as a research tool is justified not only based on theoretical validity, but also because of its ability to ascertain all dimensions of intellectual humility and its compliance with the objectives of the present study.

The four main dimensions of Alfano et al.'s (2017) Intellectual Humility Scale include openness, intellectual humility, corrigibility, and engagement, each of which plays a specific role in shaping an individual's humble behavior and attitude. Openness reflects acceptance of one's cognitive limitations and willingness to explore different perspectives. People with high openness are less likely to be prejudiced and egotistical, and have the ability to reconsider their beliefs (Cramery-Mancuso & Rose, 2016). This dimension is correlated with the trait of "openness to experience" in the Five-Factor Model of Personality (Costa & McCrae, 2008) and reveals cognitive flexibility as well as acceptance of contradictory evidence. Intellectual humility is related to an individual's attitude toward their own reputation, credibility, and cognitive abilities. Those with high intellectual humility are less likely to seek approval from others and adjust their attitudes to reality (Leary et al., 2017). This dimension helps reduce self-centeredness and enhance acceptance of others' perspectives and is correlated with positive interpersonal skills. Corrigibility indicates an individual's emotional and cognitive flexibility when faced with errors or challenges in their beliefs and knowledge. Individuals with high modifiability are able to respond to feedback and new evidence as well as revise their beliefs (Alfano et al., 2017). This dimension is linked to the concept of "learning from mistakes" and cognitive growth indicating the ability to self-regulate and reflect on cognitively. Finally, the engagement dimension shows an individual's motivation to process information and pay attention to issues about which they do not have sufficient knowledge, especially when faced with different perspectives (Alfano et al., 2017). Engaged individuals actively seek information and try to form their decisions based on diverse evidence. This

dimension is associated with the "need for knowledge" and cognitive curiosity and plays a key role in cognitive development as well as problem-solving (Petty & Cacioppo, 1982). These four dimensions combined cover not only the cognitive, emotional, and behavioral dimensions of intellectual humility, but also relate to the personality and motivational characteristics of the individual. They also provide the ability to accurately and fairly evaluate the beliefs as well as behaviors of oneself and others.

Recent research has indicated that individuals with high intellectual humility perform better in critical thinking and problem-solving (Soriano & Fabio, 2025). Intellectual humility also enhances public trust in science and scientists while reducing skepticism about scientific issues such as climate change (Kateke et al., 2024). At the collective level, group intellectual humility promotes collective wisdom, accuracy in decision-making, and reduces polarization.

However, no research has examined the psychometric properties and factor structure of this scale in Iranian society. Given the importance of cultural context in the emergence and measurement of personality traits (Bachell & Hein, 2009), such a study could fill a research gap and provide access to a valid instrument for use in future research. Accordingly, this study aimed to "explore the psychometric properties and factor structure of Alfano et al.'s (2017) Intellectual Humility Scale across the Iranian adult population."

## Method

The present study was descriptive-correlational and aimed to inspect the psychometric properties as well as factor structure of Alfano et al.'s (2017) Intellectual Humility Scale across the Iranian adult population. The statistical population included all adults aged 19 and older living in West Azerbaijan Province. Inclusion criteria included the ability to complete the questionnaire in Persian and informed consent to participate in the study, while exclusion criteria included severe cognitive impairment, failure to complete at least 90% of the questionnaires, and unwillingness to continue the study. Based on the formulas proposed by Klein (2023) and Saper (2025) for factor analysis, considering a minimum ratio of 10 people per item, a sample size of at least 286 people

was required for each analysis (exploratory and confirmatory). In this study, the total sample included 573 Iranian adults, who were assigned through simple random division into two equal groups for exploratory factor analysis (286 people) and confirmatory factor analysis (287 people). Sampling was conducted using a multi-stage random cluster and quota method. West Azerbaijan Province was first divided into urban and rural areas, and then in each area, a proportional quota of individuals was selected through public places, offices, and universities to be relatively representative of the adult population. Control measures to mitigate selection bias included proportional distribution of questionnaires based on gender, age, and education.

The main research instrument was the Intellectual Humility Scale of Alfano et al. (2017), which evaluates the cognitive, emotional, motivational, and behavioral dimensions of intellectual humility. Data analysis was divided into two stages: Exploratory factor analysis (EFA) on the first group using SPSS version 22 software to identify the factor structure of the scale as well as to determine the number of factors. Confirmatory factor analysis (CFA) was performed on the second group using LISREL software to examine the model fit, structural validity, and confirmation of the factor structure extracted from the EFA. Reliability was explored using Cronbach's alpha, composite reliability, and McDonald's omega coefficient. Convergent validity was assessed using the average variance extracted, while concurrent validity was ascertained based on the correlation of the Intellectual Humility Scale with related instruments (honesty-humility, openness to experience, and need for knowledge). The ratio of the sample to the latent variables was observed for exploratory and confirmatory analyses to provide sufficient test power for the results.

## Instruments

a) Alfano Multidimensional Intellectual Humility Scale (AMIHS): Alfano et al. (2017) developed a 22-item scale with responses on a 7-point scale from strongly disagree to strongly agree. The scale consists of four factors: (a) Open-mindedness (questions 1-6), (b) Intellectual Humility (questions 7-11), (c) Corrigibility (questions 12-16), and (d) Engagement

(questions 17-22). The scores for questions (1-5-6/8-9-10-11/12-13-16/17-19-20-21-22) are reversed (Alfano et al., 2017). Alfano et al. (2017) used the IRT approach instead of Cronbach's alpha in their original studies and confirmed the construct validity in several empirical studies. The scale has indicated satisfactory validity in both English-speaking and German-speaking samples.

Test translation process: In the present study, the translation and cultural adaptation process was carried out according to international standards (Beaton et al., 2000): Initially, the scale was translated into Persian by two psychology translators fluent in English. Next, the Persian version was retranslated into English by an independent translator, whereby the two English versions (original and retranslated) were compared. After correction of discrepancies and final review by three health psychology experts, the final version was prepared. To examine face and content validity, a preliminary version was provided to 50 students whereby the clarity, fluency, and comprehensibility of the items were examined. The content validity ratio (CVR) and content validity index (CVI) were also measured by 5 experts, where all items had values above the criterion (0.70).

B) The Five-Factor Inventory known as Big 5 Personality Traits Test (NEO-FFI): To measure openness to experience, questions from the Openness to Experience subscale (25 to 36) of the (NEO-FFI) questionnaire were used, which is a short, 60-question form of the NEOPI-R personality questionnaire. This questionnaire is scored on a five-point Likert scale from strongly disagree to strongly agree and includes the components of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Costa and McCrae, 1992). Apart from questions 25, 26, 27, 29, and 35, other questions of the Openness to Experience subscale are reverse scored. In terms of reliability, Cronbach's alpha coefficients for the main scale lie within 0.86 and 0.95, and the test-retest correlation coefficient for some scales over long time intervals has been reported to be 0.80. Grossi-Farshi (2001) obtained Cronbach's alpha coefficient of 0.45 for the openness to experience subscale. Also, the test-retest reliability

was obtained in a three-week interval within 0.53 and 0.86, indicating the desired internal and temporal stability of this tool. In the study by Rabiei et al. (1402), Cronbach's alpha coefficient for openness to experience was reported to be 0.67, which is an acceptable value for research purposes.

c) Need for Cognition Scale (NCS): The revised Need for Cognition Scale of Casipo and Petty (1982) is an 18-question self-report scale in which the subjects' responses to each question are recorded on a 5-point Likert scale from always (score 4) to never (score 0), questions 2, 4, 5, 7, 8, 9, 12, 16, and 17 are reverse scored. The initial version of this questionnaire was 34 items, which was later reviewed by Casipo and Petty (1984) whereby a shorter 18-item version was introduced. In terms of psychometric properties, international studies have indicated that the Need for Cognition Scale has a unidimensional factor structure and desirable reliability. For instance, Casipo et al. (1996) reported in their review that the Cronbach's alpha of this questionnaire is usually within the range of 0.70 to 0.90, indicating acceptable internal consistency. Also, the convergent and divergent validity of this tool has been confirmed through correlations with variables such as progress motivation, deep information processing, and cognitive styles (Nair and Ramarayan, 2000). In Iran, Zare and Rastegar (2015) also inspected the psychometric properties of the 18-item version of this tool and reported a Cronbach's alpha reliability coefficient of 0.77 for the entire questionnaire and a test-retest coefficient of 0.74 with a two-week interval. This demonstrates the appropriate internal consistency and stability of this tool. In addition, the criterion validity of the questionnaire has also been confirmed in domestic and foreign studies. For example, Ghorban Jahromi et al. (2015) revealed that the need for cognition has a positive and significant relationship with cognitive engagement and achievement goals. This finding is in line with international reports such as the studies by Casipo and Petty (1982) and Casipo et al. (1996), which consider the need for cognition to be a predictive factor in deep information processing and informed decision-making. In the present study, the Cronbach's alpha coefficient was 0.83.

d) HexaCo-60 Personality Inventory: This questionnaire is a model of the factor dimensions of personality (Lee and Ashton, 2004) consisting of 60 questions and six broad dimensions of honesty-humility, excitability, extraversion, agreeableness, conscientiousness, and openness to experience. Each dimension has 10 questions scored on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Cronbach's alpha coefficient for the six factors has fluctuated within the range of 0.87 to 0.94 and for its traits from 0.71 to 0.92 (Miller et al., 2009). In the study by Lee and Ashton (2004), Cronbach's alpha was 0.92 for honesty-humility, 0.90 for excitability, 0.92 for extraversion, 0.89 for agreeableness, 0.89 for conscientiousness, and 0.90 for openness to experience. In Bashiri's study (2011), the questionnaire was standardized, where factor analysis was performed using the principal components method using Varimax rotation. The KMO value was 0.67, which was higher than the recommended value of 0.60, and Bartlett's sphericity test had a significance level of less than 0.05. Principal component analysis revealed the existence of six components with eigenvalues greater than one, each explaining 16.33, 12.48, 10.50, 9.76, 9.54, and 9.27% of the variance, respectively. Overall, the six-component solution explained 67% of the total variance. Khazri and Manavipour (2016) obtained a Cronbach's alpha of 0.48 for this subscale.

## Results

The descriptive indices related to each of the questionnaire questions are reported in Table 1.

**Table 1. Descriptive indices related to each of the questionnaire items**

| Item No. | Mean | SD | Item correlation - Total | Squared correlation | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| 1 | 3.83 | 0.81 | 0.56** | 0.28 | 0.05 | -1.27 |
| 2 | 6.47 | 0.94 | 0.32* | 0.88 | 1.4 | 1.18 |
| 3 | 6.35 | 0.96 | 0.89* | 0.80 | 1.73 | 1.19 |
| 4 | 6.25 | 0.56 | 0.88* | 0.77 | 1.77 | 1.9 |
| 5 | 6.03 | 0.60 | 0.35** | 0.12 | -1.79 | 1.89 |
| 6 | 4.83 | 0.68 | 0.48** | 0.06 | -0.61 | -0.72 |
| 7 | 4.00 | 0.81 | 0.31* | 0.10 | -0.02 | -1.31 |
| 8 | 2.35 | 0.57 | 0.36** | 0.13 | 1.36 | 1.87 |
| 9 | 3.01 | 0.56 | 0.47** | 0.22 | 0.80 | -0.06 |
| 10 | 3.89 | 0.69 | 0.48** | 0.23 | 0.15 | -0.99 |
| 11 | 3.41 | 0.73 | 0.50** | 0.25 | 0.43 | -0.77 |
| 12 | 4.58 | 0.67 | 0.62** | 0.38 | -0.35 | -0.99 |
| 13 | 4.66 | 0.56 | 0.59** | 0.35 | -0.40 | -0.87 |
| 14 | 5.54 | 0.43 | 0.58* | 0.35 | 1.20 | 1.09 |
| 15 | 5.52 | 0.77 | 0.33** | 0.11 | 1.18 | 0.86 |
| 16 | 5.35 | 0.53 | 0.43** | 0.18 | -0.93 | -0.11 |
| 17 | 4.12 | 0.64 | 0.38** | 0.15 | 0.04 | -1.08 |
| 18 | 5.65 | 0.61 | 0.40* | 0.16 | 1.22 | 1.43 |
| 19 | 4.58 | 0.65 | 0.52** | 0.27 | -0.39 | -0.91 |
| 20 | 4.91 | 0.63 | 0.50** | 0.25 | -0.83 | -0.26 |
| 21 | 3.53 | 0.82 | 0.53** | 0.28 | 0.41 | -1.05 |
| 22 | 5.33 | 0.60 | 0.52** | 0.27 | -1.02 | 0.11 |

Prior to factor analysis, the descriptive characteristics of the items were examined. For each of the 22 scale questions, the mean, standard deviation, skewness, kurtosis, corrected item-total correlation, and Cronbach's alpha were calculated when items were removed (Table 1). The results revealed that all indicators were within the acceptable range; item-total correlation coefficients were higher than 0.30, and removing any item did not increase the alpha of the entire scale. Thus, all items were retained in the subsequent factor analysis. This finding suggests that each question makes a significant contribution to measuring the construct of intellectual humility, and the normality of the distribution (skewness and kurtosis within the range of ±2) also made factor analyses possible.

**Table 2. KMO and Bartlett sphericity test**

| P | Bartlett's Sphericity | KMO |
|---|---|---|
| 0.000 | 3449 | 0.81 |

To explore the adequacy of the data for factor analysis, the KMO index and Bartlett's sphericity test were calculated (Table 3). The Kaiser-Meier-Olkin test tests the first objective of factor analysis, which is whether the variance of the research variables is affected by the common variance of some latent and fundamental factors. The KMO value was 0.81,

which is higher than the threshold of 0.60 and confirms the adequacy of the sample for factor analysis. The Bartlett test was also significant ($\chi^2$= 3449, df= 231, p< 0.001), reflecting the existence of sufficient correlation between the items. Thus, the data were suitable for factor analysis.

**Table 3. Identifying the contribution of each factor to explaining the total variance of all questions**

| Factor | Initial Eigenvalue | | |
|---|---|---|---|
| | Total | Variance percentage | Variance cumulative percentage |
| 1 | 3.68 | 23.01 | 23.01 |
| 2 | 2.38 | 14.87 | 37.88 |
| 3 | 1.55 | 9.71 | 47.58 |
| 4 | 1.28 | 7.98 | 55.56 |

As can be observed in Table 3, in order to identify the factor structure of the scale, a principal component analysis was performed with Varimax rotation. The examination of the eigenvalues revealed that four factors with eigenvalues higher than one were extracted (Table 4). The first factor explained 23.01%, the second factor 14.87%, the third factor 9.71%, and the fourth factor 7.98% of the variance, covering a total of 55.61% of the variance of the entire questionnaire. Factor loadings were calculated

in both rotated and unrotated forms (Table 5); it was found that all items had factor loadings higher than 0.40. Hence, no items were removed. Specifically, the first factor was loaded with items related to "open-mindedness", the second factor with "intellectual humility", the third factor with "corrigibility" and the fourth factor with "engagement". This structure is in line with the theoretical model of Alfano et al. (2017).The results are outlined in Table 5.

**Table 4. Results of the exploratory factor analysis of Alfano's Intellectual Humility Scale in the current study**

| Item No. | Item | Factor 1 (Open mid) | Factor 2 (intellectual humility) | Factor 3 (corrigibility) | Factor 4 (Engagement) |
|---|---|---|---|---|---|
| 1 | I think it's a waste of time to pay attention to people who disagree with me. | 0.73 | | | |
| 2 | Learning from someone who is wiser does not embarrass me. | 0.58 | | | |
| 3 | If I don't know much about a subject, I don't mind being taught that subject, even if I have expertise in other subjects. | 0.57 | | | |
| 4 | Even when I have a high position, I don't mind learning from my subordinates. | 0.86 | | | |
| 5 | Only the incompetent admit their mistakes. [Edited statement: Only the incompetent admit that they are confused.] | 0.73 | | | |
| 6 | I don't take people who are very different from me seriously. | 0.59 | | | |
| 7 | Being smarter than others doesn't matter to me. | | 0.58 | | |
| 8 | I like to explain things that others don't understand. | | 0.87 | | |
| 9 | It's very enjoyable for me to be smarter than others. | | 0.64 | | |
| 10 | I want others to know that I am incredibly intelligent. | | 0.72 | | |
| 11 | I want to be the smartest person in the group. | | 0.58 | | |
| 12 | I feel angry and frustrated when I hear the statement that your opinion is wrong. | | | 0.51 | |
| 13 | I usually get upset if someone exposes my wrong thoughts and opinions. | | | 0.55 | |
| 14 | I would like my mistakes to be corrected. | | | 0.68 | |
| 15 | I don't feel embarrassed when they correct my mistake. | | | 0.63 | |

| Item No. | Item | Factor 1 (Open mid) | Factor 2 (intellectual humility) | Factor 3 (corrigibility) | Factor 4 (Engagement) |
|---|---|---|---|---|---|
| 16 | I feel humiliated and frustrated when I realize that someone is more knowledgeable than me. | | | 0.51 | |
| 17 | I rarely discuss things with others that I wish I understood better. | | | | 0.68 |
| 18 | I enjoy reading about the beliefs of different cultures. | | | | 0.77 |
| 19 | Reading a book about opinions that contradict mine makes me extremely tired. | | | | 0.53 |
| 20 | It has never been enjoyable for me to understand why others disagree. | | | | 0.54 |
| 21 | I find it boring to discuss things I don't understand. | | | | 0.66 |
| 22 | Opposition is like declaring war. | | | | 0.55 |

In order to ascertain the construct validity, confirmatory factor analysis was performed using LISREL software. Since it was not possible to conduct both analyses (EFA and CFA) concurrently in one sample, the data were divided into two parts: 286 people for exploratory analysis and 287 people for confirmatory analysis. The four-factor model revealed a good fit to the data (Table 5). The fit indices were within the desired range: $\chi^2/df= 2.5$, RMSEA= 0.05, CFI= 0.94, NNFI= 0.92, NFI= 0.93 and GFI= 0.83. The values of AGFI= 0.86 and PNFI= 0.74 also confirmed the goodness of fit of the model. Fig. 1 presents the standard factor loadings and Fig. 2 depicts the significance values (t-values). The results indicate that the factor structure fits the data. The goodness-of-fit indices from the confirmatory factor analysis are provided in Table 5.

**Table 5. Goodness-of-fit indices of the Intellectual Humility Scale**

| Index | X2 /df | RMSEA | PNFI | NFI | AGFI | CFI | NNFI | GFI |
|---|---|---|---|---|---|---|---|---|
| Criterion | < 3 | < 0.08 | > 0.5 | > 0.9 | > 0.8 | > 0.9 | > 0.9 | > 0.8 |
| Result | 2.5 | 0.05 | 0.74 | 0.93 | 0.86 | 0.94 | 0.92 | 0.83 |

As can be observed in Table 5, the AGFI, NNFI, CFI, GFI, and NFI values are greater than the criterion value and the RMSEM is less than 0.08. The balanced fit and goodness-of-fit indices are in the range of zero to one. From the point of view of Bentler and Bonnet, when the root mean square error estimate is less than 0.10, the analysis reports an acceptable fit (Bahrami et al., 2018).

Cronbach's alpha and composite reliability (CR) methods were used to measure the reliability of the intellectual humility scale, and the average variance extracted (AVE) was used to measure the validity.

To explore the reliability, Cronbach's alpha coefficient and composite reliability (CR) were calculated. All coefficients were above 0.70, indicating adequate reliability of the scale (Table 7). Also, the average variance extracted (AVE) was above 0.50, indicating the convergent validity of the scale. In addition, the HTMT index was calculated and all values were less than 0.85, confirming the divergent validity. These findings indicate that the scale is construct valid.

To explore the criterion (concurrent) validity, the correlation of the Intellectual Humility Scale and its dimensions with the relevant theoretical variables was calculated (Table 7). The results revealed that Intellectual Humility was positively and significantly correlated with "Honesty-Humility" from the Honesty-Humility Scale of the Hexagon-60 Questionnaire (Ashton & Lee, 2009), Openness to Experience from the Big Five Personality Inventory (Costa & McCrae, 1992), and Need for Cognition from the Need for Cognition Questionnaire (Cacioppo & Petty, 1982) (p< 0.01). These findings strongly support the concurrent validity of the scale.
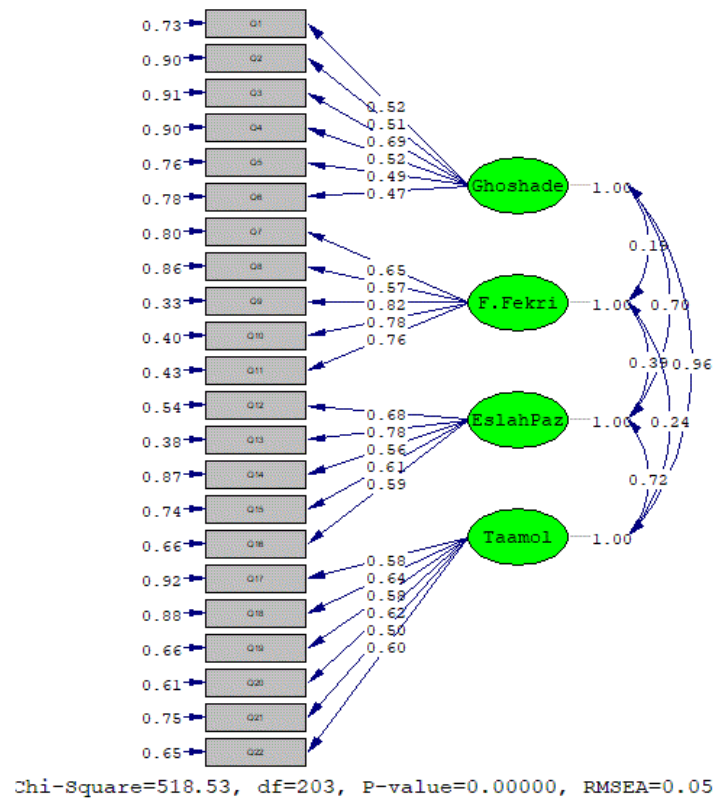
Chi-Square=518.53, df=203, P-value=0.00000, RMSEA=0.052

**Figure 1. Standard measurement pattern in LISREL software**



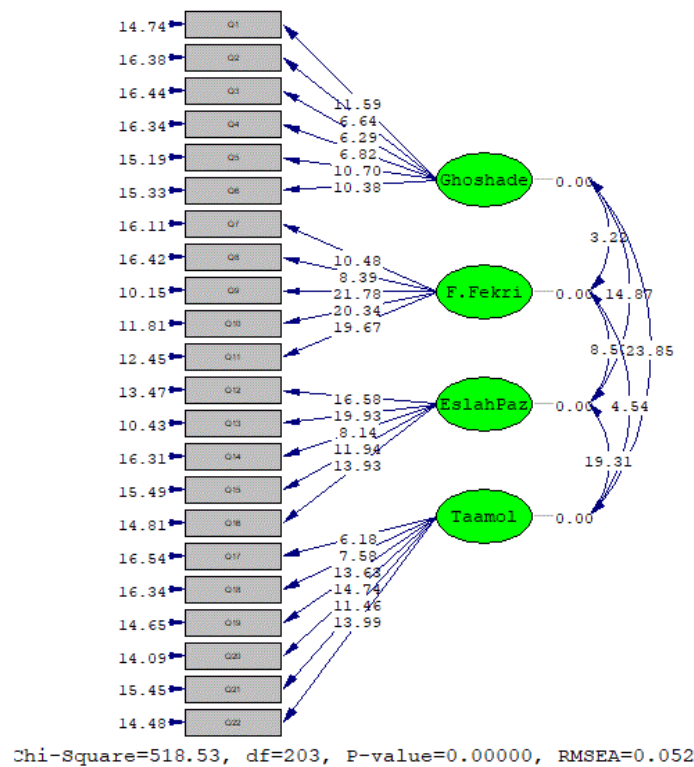Chi-Square=518.53, df=203, P-value=0.00000, RMSEA=0.052

**Figure 2. Measurement pattern of non-standard questionnaire in LISREL software**

**Table 6. Reliability and validity coefficient of the intellectual humility scale and its factors in the preliminary (n= 50) and final (n= 573) implementations**

| Item | Reliability coefficient in preliminary implementation | | Validity coefficient in preliminary implementation | Reliability coefficient in final implementation | | Validity coefficient in final implementation |
|---|---|---|---|---|---|---|
| | α | CR | AVE | α | CR | AVE |
| Open-mindedness | 0.79 | 0.81 | 0.61 | 0.82 | 0.88 | 0.62 |
| Intellectual humility | 0.81 | 0.84 | 0.58 | 0.86 | 0.89 | 0.62 |
| Corrigibility | 0.71 | 0.84 | 0.51 | 0.75 | 0.90 | 0.58 |
| Engagement | 0.80 | 0.86 | 0.57 | 0.85 | 0.90 | 0.59 |

**Table 7. Correlation matrix of the intellectual humility scale with honesty-humility, need for knowledge, and openness to experience**

| No. | Component | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Intellectual humility | 1 | | | | | | | |
| 2 | Open mindedness | 0.71** | 1 | | | | | | |
| 3 | Intellectual humility | 0.56** | 0.40** | 1 | | | | | |
| 4 | Corrigibility | 0.77** | 0.45** | 0.25** | 1 | | | | |
| 5 | Engagement | 0.77** | 0.57** | 0.33** | 0.48** | 1 | | | |
| 6 | Honesty-humility | 0.53** | 0.37** | 0.46** | 0.36** | 0.28** | 1 | | |
| 7 | Need to cognition | 0.39** | 0.35** | 0.37** | 0.38** | 0.48** | 0.20** | 1 | |
| 8 | Openness to experience | 0.41** | 0.42** | 0.28** | 0.27** | 0.58** | 0.51** | 0.55** | 1 |

## Conclusion

The aim of the present study was to examine the psychometric properties and factor structure of the Intellectual Humility Scale in Iranian adults. The findings indicated that all items were appropriate in terms of clarity, fluency, and understandability; also, psychological experts confirmed that their content and formulation were consistent with the purpose of measuring the dimensions of Intellectual Humility. These results align with the theoretical approach of Beaton et al. (2000) who emphasize that the process of translation and cultural adaptation should ensure the clarity and understanding of the items. The researcher also observed that no item was ambiguous or vague and the CVR and CVI indices showed that each item made a significant contribution to the representation of the construct and therefore it can be employed as a valid tool in Iranian studies.

Exploratory factor analysis confirmed the four-factor structure of the scale, including open-mindedness, intellectual humility, corrigibility, and engagement. These results are in accordance with the findings of Alfano et al. (2017) as well as Kramer and Roose (2016), who consider the main dimensions of intellectual humility to include cognitive flexibility, acceptance of cognitive limitations, ability to revise beliefs, and motivation to process information. The researcher observed that all items had high factor loadings and no items needed to be deleted, indicating

logical convergence of the dimensions as well as internal validity of the scale in the Iranian population. The Cronbach's alpha coefficient and composite reliability (CR) of all scale dimensions were above acceptable levels, indicating high internal consistency and response stability. These findings are consistent with previous studies in English-speaking and German-speaking samples (Alfano et al., 2017). This means that the scale is reliable in continuously measuring intellectual humility and shows that the different dimensions of the scale can accurately measure the behavior and attitude of the individual towards himself and others.

Confirmatory factor analysis confirmed the four-factor model and the model fit indices were within the desired range. These results suggest the structural validity of the scale and its consistency with the theoretical model of intellectual humility (Kottke et al., 2024). The factor structure of the scale not only corresponds to the data of the Iranian population, but also demonstrates the ability to distinguish between the cognitive, emotional and behavioral dimensions of intellectual humility well and can be generalized to clinical and research applications.

The results of the concurrent and divergent validity study revealed that intellectual humility and its dimensions have a positive and significant correlation with related variables such as honesty-humility, openness to experience, and

need for knowledge. Divergence indices were also within the desired range, indicating construct validity and differentiation of related and unrelated constructs (Hanser et al., 2015). These findings provide strong support for the scale's application in personality psychology studies and cultural research. The main limitation of the study was the sampling from a specific province and based on voluntary consent, which may limit the generalizability of the results. Further, the impact of cultural and social differences on response was not examined. It is suggested that future studies use more geographically and culturally diverse samples and explore the practical application of the scale in educational, organizational, and clinical settings. A comparative study of intellectual humility in different cultures and societies can provide valuable information on the nature and dimensions of this construct and allow the design of culture-based psychological interventions.

Overall, the results of the current study revealed that Alfano et al.'s (2017) Intellectual Humility Scale with a 4-factor structure and 22 items fits the Iranian sample data, and the scale has favorable psychometric properties and is therefore suitable for implementation in an Iranian adult sample. Further research is needed to compare the results across different samples and populations, as well as to expand knowledge about the intellectual humility construct and its measurement, so replication of the study is recommended.

## Ethical Considerations

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