Research Paper

Psychometric Properties of the Persian Version of Adult Sources of Self-esteem Inventory Among Iranian Students

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ABSTRACT

Objective: This study aims to determine the validity and reliability of the Persian version of the adult sources of self-esteem inventory as a cross-cultural scale for assessing self-esteem.

Methods: A sample of 500 students (350 females, 150 males) were selected from Kharazmi University in Iran and they completed the Persian version of the adult sources of Elovson and Fleming's self-esteem inventory and Rosenberg's self-esteem scale.

Results: The Cronbach α of 0.90 indicated the satisfactory reliability of the inventory. Also, the results of the explanatory factor analysis proposed 3 factors, namely the outer self, personal self, and relational self. Additionally, the confirmatory factor analysis confirmed this structure.

Conclusion: The findings showed that the Persian version of the adult sources of self-esteem inventory is a suitable tool to assess sources of self-esteem and can be used in research and intervention fields in Iranian samples.

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Highlights

- Investigating validity of the Persian version of Adult Sources of Self-Esteem Inventory among Iranian students;
- Investigating reliability of the Persian version of Adult Sources of Self-Esteem Inventory among Iranian students;
- Investigating factor structure of the Persian version of Adult Sources of Self-Esteem Inventory among Iranian students.

Plain Language Summary

Self-esteem is an important concept in psychology. It seems that this concept can be different across various cultures and the factors that leads people to see themselves positively, can be different. As a result, we need the scale that consider multiple dimensions of self and source of self-esteem in people from various people. One of the scales that asses' different facets of self-esteem is the Adult Source of Self-Esteem Inventory (ASSEI) (Elovson and Fleming, 1989). In the present study, we investigated reliability and factor structure the scale among an Iranian sample that the results showed the scale have three factors structure in the sample.

1. Introduction

Self-esteem is an important subject in the field of psychology and social sciences. Most psychologists agree that self-esteem plays an essential role in mental health. In this regard, the literature has shown that lower self-esteem is associated with depression (Cheng & Furnham, 2003; Orth, et al., 2008; Steiger, 2014; Park & Yang,2017), disordered eating (Colmsee, et al., 2021; Jonstang, 2009), internet addiction (Zhou & Wan ,2021; Aydm & San,2011), in addition to other mental health problems (Ybrandt & Armelius, 2010; Merianos et al., 2013). Although research shows the importance of self-esteem, several studies have shown that Asian participants' scores in self-esteem tests were consistently lower than American and Western participants' scores. It seems that people in various cultures have different definitions of self-esteem.

Some studies also maintain that the definition of self-esteem can be different in various cultures and situations (Twenge & Crocker, 2002; Bachman & O'Malley, 1984; Feather & McKee, 1993; Hoge & McCarthy, 1984; Luk & Bond, 1992; Trafimow et al., 1991; Verkuyten, 1993; Singelis et al., 1999; Cia et al., 2009; Heine et al., 1999; Kim et al., 2010; Brown et al., 2009). Wang and Ollendick (2001) investigated self-esteem in Chinese and Western children and found that self-esteem does not have the same definition across these collectivist and individualistic cultures. They found that scores on self-esteem scales are lower among Asians because this population does not tend to express positive evaluations about themselves or they describe themselves in relation to others. Also, in these cultures, interpersonal relationships and dependency on the group are encouraged. In this regard, Kitayama et al. (1999) proposed the self-construal theory. According to the self-construal theory, people in different cultures have strikingly different construal of the self, of others, and of interdependence. They believe that many Asian cultures have distinct conceptions of individuality that insist on the fundamental relatedness of individuals to each other. The emphasis is on attending to others, fitting in, and harmonious interdependence. American culture neither assumes nor values such an overt connectedness among individuals. In contrast, individuals seek to maintain their independence from others by attending to the self and by discovering and expressing their unique inner attributes. For example, American situations are relatively conducive to self-enhancement and American people are relatively likely to engage in self-enhancement while Japanese situations are relatively conducive to self-criticism and Japanese people are comparatively likely to engage in self-criticism.

Moreover, the factors that lead people to see themselves positively can be different. As a result, a self-concept instrument should consider multiple dimensions of the self. However, many existing measures of global self-esteem, such as Rosenberg's Self-esteem Scale (SES) and Coopersmith's Self-esteem Inventory (SEI) were developed based on Western cultures. Accordingly, we need a scale that considers multiple dimensions of the self and sources of self-esteem in people from various cultures. This issue expresses the need for a new scale that is useful in different cultures. One of the scales that as-

sesses different facets of self-esteem is the Adult Source of Self-esteem Inventory (ASSEI) (Fleming & Elovson, 1989). This scale was designed based on the self-construal theory of Markus and Kitayama (1999) and has a multidimensional structure. The main advantage of the scale is that it assesses multiple dimensions of the self in different cultures. Also, it considers the factors that can affect self-esteem as the source of self-esteem. This is important because self-esteem can be different from one domain to another or different throughout an individual's life span. Therefore, ASSEI can be used as a self-esteem instrument for various people and in different cultures. Although the scale was investigated in many cultures, ASSEI is not validated in the Persian language. Therefore, this study aims to assess the psychometric properties of the Persian version of Adult Source of Self-esteem Inventory (ASSEI) among Iranian students.

2. Matewrials and Methods

Study participants and procedures

The participants were 500 students, namely 350 (70%) females and 150 (30%) males from kharazmi University in Iran. The age range was from 18 to 35 years. The research data were collected from March to June 2018. We used the Persian version of ASSEI by Elovson and Fleming along with SES by Rosenberg. At first, the original version of the questionnaire was translated into Persian by an expert translator using the back translation method. Then, a psychology expert investigated the content. Finally, the scale was distributed among students. The data were gathered through a paper-pencil questionnaire. The average time for answering the questions was 20 min. All students participated voluntarily in the research and the investigator provided the necessary help.

Measures

Adult Sources of Self-Esteem Scale (ASSEI)

The Persian version of Adult Source of Self-esteem Inventory (ASSEI) was used. This scale has two separate form to complete that including: Form A and Form B, form A, asses the importance of aspects and form B, asses satisfaction with aspects, each form containing the 20 items to be rated on a 0-10 scale. participants rate their agreement or disagreement with each option on this rate. Also, this scale has 8 categories, including appearance and popularity, intellect and abilities, personal achievement and recognition, personal control, ethics and integrity, relations with others, and religion or spirituality. ASSEI has been studied in various studies and its validity has been reported as favorable. The validity of the scale was obtained at the range of 0.85 to 0.97 using the Cronbach α method (Watkins & Yu, 1993; Van de Vijver & Watkins, 2006; Li et al., 2006; Marčič & Kobal Grum, 2011). In Iran, this questionnaire has not been used in research yet.

Rosenberg's Self-Esteem Scale

Rosenberg's SES was used to assess convergent validity. This scale has 10 items that refer to self-respect and self-acceptance rated on a 4-point Likert-based scale, ranging from 1 (totally disagree) to 4 (totally agree). Items 1, 3, 4, 7, and 10 are positively worded while items 2, 5, 6, 8, and 9 are worded negatively. This scale has been widely used in studies related to self-esteem and its validity and reliability have been reported as favorable (Robins et al., 2001; Martin-Albo et al., 2007; Goldsmith, 1986; Sinclair, 2010; Quilty et al., 2006; Shapurian et al., 1987). In most studies, the internal consistency with the Cronbach α method was shown in the range of 0.80 to 0.89 (Kourakou et al., 2021; Hatcher & Hall, 2009; Piyavhatkul, 2011; Franck et al., 2008). In Iran, some studies reported moderate to satisfactory levels of internal consistency using Cronbach's alpha and showed that the scale has the unidimensionality factor structure (Mohammadi et al., 2008; Shapurian et al., 1987).

3. Results

Data analysis

We used the software R (R Core Team, 2019), the psych package (Revelle, 2020), EGAnet (Golino & Christensen, 2020), and lavaan (Rosseel, 2012), along with MPLUS (Muthén & Muthén, 1998-2011) to analyze the data. The methods used for the factor structure investigation included parallel analysis, exploratory graph analysis (EGA), and exploratory factor analysis (EFA). Then the identified factors structures were checked out by confirmatory factor analysis (CFA). Finally, composite reliability and discrimination validity of factors from different models were checked by omega and AVE (average variance extracted) indices. In addition, the ubiquitous α index was used to examine the internal consistency.

Items statistics

According to Table 1 and Figure 1 (for item 5) and Figure 2 (for item 13), not all options discriminate between the traits measured by items. An 11-points Likert scale (0 to 10) was used in the ASSEI test. As the results show, using a wide range is undesirable as it re-

Table 1. Descriptive statistics of items and their options

Items	Raw. r	R. cor.	R. drop	Mean±SD	0	1	2	3	4	5	6	7	8	9	10
SE1	0.40	0.34	0.31	7.2±2.6	0.01	0.03	0.02	0.03	0.04	0.15	0.06	0.12	0.16	0.10	0.27
SE2	0.52	0.49	0.46	8.2±2.1	0.00	0.01	0.01	0.02	0.02	0.07	0.06	0.09	0.16	0.19	0.38
SE3	0.58	0.55	0.52	7.7±2.3	0.01	0.00	0.01	0.03	0.05	0.10	0.10	0.10	0.15	0.18	0.28
SE4	0.69	0.69	0.65	8.8±1.7	0.00	0.00	0.01	0.01	0.01	0.03	0.03	0.08	0.13	0.20	0.49
SE5	0.70	0.71	0.66	8.9±1.8	0.00	0.00	0.01	0.01	0.01	0.04	0.03	0.06	0.10	0.12	0.62
SE6	0.44	0.37	0.35	7.5±2.9	0.04	0.02	0.02	0.02	0.05	0.09	0.06	0.08	0.13	0.14	0.34
SE7	0.59	0.57	0.53	8.0±2.3	0.01	0.01	0.01	0.02	0.04	0.08	0.07	0.09	0.13	0.15	0.39
SE8	0.60	0.60	0.54	8.7±2.0	0.00	0.01	0.01	0.01	0.02	0.05	0.04	0.05	0.09	0.15	0.56
SE9	0.55	0.51	0.48	7.9±2.3	0.01	0.00	0.02	0.02	0.03	0.09	0.07	0.10	0.16	0.17	0.33
SE10	0.67	0.68	0.63	8.9±1.8	0.00	0.01	0.01	0.01	0.00	0.03	0.03	0.06	0.09	0.16	0.59
SE11	0.60	0.61	0.56	8.9±1.7	0.00	0.00	0.01	0.01	0.02	0.03	0.03	0.06	0.13	0.15	0.56
SE12	0.65	0.63	0.60	8.2±2.1	0.00	0.00	0.02	0.02	0.02	0.07	0.06	0.11	0.17	0.15	0.38
SE13	0.72	0.71	0.68	8.5±1.8	0.00	0.00	0.01	0.01	0.01	0.05	0.04	0.08	0.18	0.18	0.43
SE14	0.69	0.68	0.64	8.5±1.9	0.00	0.00	0.01	0.01	0.02	0.04	0.06	0.08	0.15	0.16	0.46
SE15	0.67	0.66	0.62	8.1±2.1	0.00	0.00	0.01	0.02	0.04	0.08	0.05	0.11	0.16	0.14	0.40
SE16	0.57	0.52	0.49	7.1±2.5	0.02	0.01	0.03	0.04	0.05	0.10	0.10	0.14	0.14	0.14	0.23
SE17	0.57	0.53	0.50	7.7±2.4	0.02	0.01	0.01	0.02	0.03	0.11	0.06	0.11	0.16	0.16	0.31
SE18	0.71	0.70	0.66	8.6±2.0	0.01	0.00	0.01	0.01	0.03	0.05	0.04	0.07	0.13	0.18	0.48
SE19	0.61	0.59	0.56	7.9±2.0	0.00	0.00	0.01	0.03	0.02	0.06	0.08	0.14	0.19	0.18	0.29
SE20	0.54	0.51	0.47	8.3±2.3	0.01	0.00	0.02	0.02	0.03	0.05	0.06	0.09	0.12	0.15	0.45

Raw.r: The correlation of each item with the total score which is not corrected for item overlap.

R.cor shows the item's correlation corrected for item overlap and scale reliability.

R.drop shows the item's correlation for this item against the scale without this item.

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quires increasing the sample size to accurately estimate item parameters. Also, the preference of the person in selecting the items is on the marginal options (that is, options 0, 1, 2, and 10). Other options neither discriminated persons well nor received much attention (Table 1 and item 5 plots, for example). Therefore, appropriate points for items in this scale should be lower than 11. Meanwhile, 7, 5, or even 3 points are a good option for this scale. According to Table 1, items 1 and 6 have the lowest correlation with the total raw score. The mean of all items was greater than 7 and their standard divisions were about 2 for all items, except for item 6 which had the greatest mean and standard deviation.

Parallel analysis and related statistics

The results from parallel analysis by the psych package (Revelle, 2020) indicated 4 factors and 3 components. The Velicer's MAP (minimum average partial) values for the first 4 factors were 0.024, 0.021, 0.018, and 0.020, respectively; accordingly, this shows 3 factors. The SRMR (standardized root mean square residual) statistic for the first factors were 0.096, 0.063, 0.039, and 0.037, respectively. This again shows that 3 factors are enough for explaining items' correlations. The lowest BIC (Bayesian Information Criterion) and SABIC (sample-size-adjusted BIC) values (-177.09 and 245.16, respectively) were achieved for 3 factors.

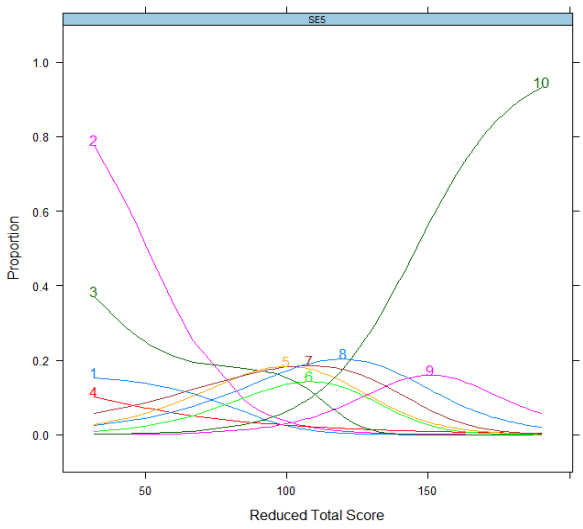

Figure 1. Smoothed proportion of selection for the options of item 5

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Exploratory graph analysis

The results from the EGA method (Golino and Christensen, 2020) showed 3 factors. The pattern of items in 3 clusters (factors) can be seen in Figure 3. The fitness of the structures suggested by EGA can be verified using the CFA method and the stability of EGA's estimation can be investigated via parametric and nonparametric bootstraps, which both are based on random sampling. We used 1000 samples for both of these methods.

Based on the observed correlation matrix, the parametric bootstrap generated data from a multivariate normal distribution with the same number of cases and variables as the original sample. Then, the computation and analysis of the partial correlation matrix for each sample was done. Finally, a typical median network structure, which is formed by the median or mean pairwise (partial) correlations over n bootstraps (n=1000 in the present research) was graphed. The nonparametric bootstrap resampled from the data sample; therefore, it does not rely on a specific distribution. This approach, however, can be less reliable when outliers exist in the sample which then gets resampled and appears in the sample more often than it would be expected; that is, outliers can have stronger ef-

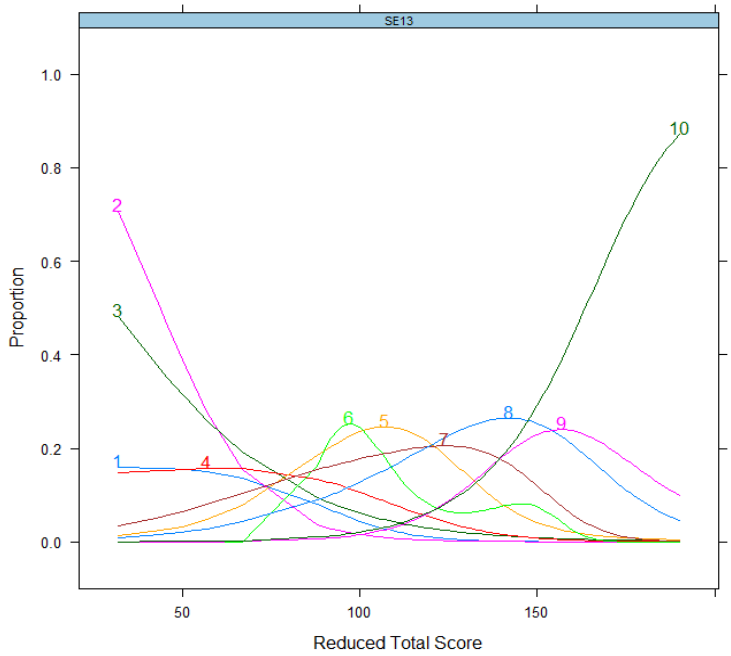

Figure 2. Smoothed proportion of selection for the options of item 13

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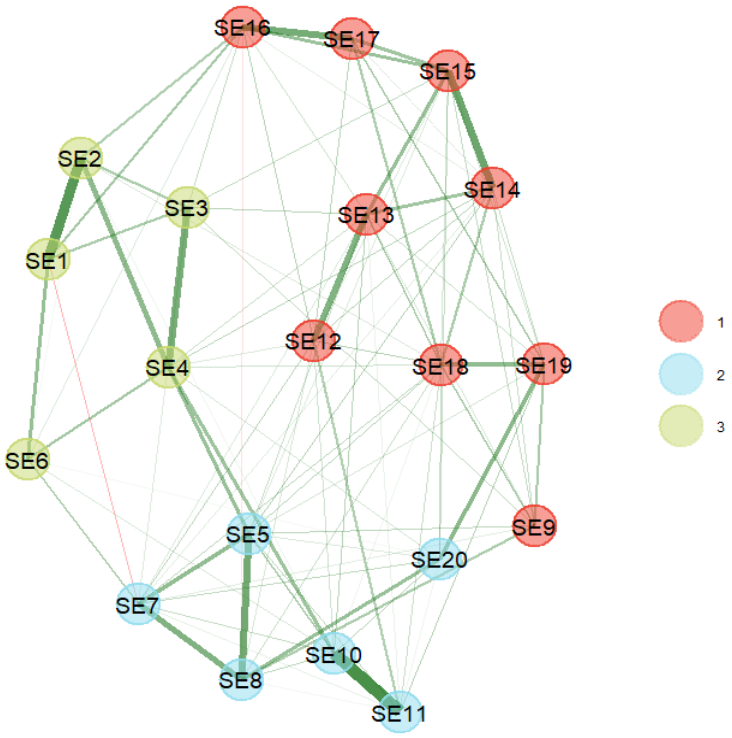

Figure 3. Result from exploratory graph analysis on the sample data

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fects on the results than they would otherwise. According to Table 2, while 3 factor is the more dominant structure (66.1%) based on parametric bootstrap, the repetition percentage of 4, 5, and 6 structures are very low. Although 4 factor is the most dominant (46%) for nonparametric bootstrap, the repetition of 3 factor structure is very close to it (43.9%). The repetition of 5, 6, and 7 factor is very low in the nonparametric method, which shows their low stability; therefore, they can be ignored.

Exploratory factor analysis

Exploratory factor analysis results with Geomin (oblique) in Table 3 for 3 and 4 factor structures show that some items have significant loadings on 2 (for example, item 16, 18, and 19 in 3-factor solution) or even 3 factor (for example, item 12 and 13 in 3-factor solutions) structures. Although assigning the items to factors is based on the largest loading, loadings are approximately large for some item crosses. For example, items 18 and 19 in 3-factor solutions load on factors 2 and 3. Accordingly, cross-loadings are less for 4-factor solutions and more for the 3-factor structures.

The pattern of items for various factors (clusters) results from EFA and EGA methods that are shown in Table 4. As shown, a similarity exists between patterns in different methods but the one that has a theoretical interpretation is

Table 2. Proportion of repetition for 2 and 7 factor structures

Factors	Parametric	Nonparametric
2	0.002	-
3*	0.661	0.439
4*	0.125	0.460
5	0.105	0.086
6	0.102	0.014
7	0.005	0.001

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Table 3. Rotated (Geomin [oblique]) loadings for 3 and 4 factors along with R^2 values

Items*	Three Factor				Four Factor				
	1	2	3	R^2	1	2	3	4	R^2
SE1	0.827*	-0.215*	0.001	0.621	0.803*	-0.213*	0.009	0.005	0.617
SE2	0.790*	0.016	-0.055	0.607	0.785*	0.020	-0.033	0.018	0.611
SE3	0.477*	0.189*	0.129*	0.387	0.480*	0.125	0.198*	-0.041	0.399
SE4	0.466*	0.420*	0.041	0.534	0.469*	0.335*	0.123	0.027	0.537
SE5	0.058	0.792*	0.007	0.662	0.085	0.718*	0.089	0.050	0.684
SE6	0.391*	0.179*	-0.085	0.206	0.399*	0.195*	-0.069	0.021	0.207
SE7	-0.054	0.702*	0.000	0.472	-0.022	0.655*	0.070	0.014	0.489
SE8	-0.015	0.773*	-0.098*	0.565	0.034	0.796*	-0.055	0.008	0.605
SE9	-0.012	0.437*	0.240*	0.293	-0.003	0.313*	0.345*	-0.060	0.305
SE10	0.193*	0.667*	-0.039	0.544	0.111	0.328	0.038	0.500*	0.623
SE11	0.154*	0.594*	-0.022	0.425	-0.035	-0.003	-0.006	1.039*	1.049
SE12	0.133*	0.409*	0.319*	0.409	0.081	0.106	0.462*	0.126	0.412
SE13	0.133*	0.457*	0.397*	0.542	0.096*	0.161	0.563*	0.041	0.541
SE14	-0.001	0.451*	0.512*	0.574	-0.035	0.133	0.692*	-0.009	0.574
SE15	-0.016	0.333*	0.652*	0.628	-0.049	0.006	0.855*	-0.110	0.632
SE16	0.336*	-0.031	0.541*	0.512	0.266*	-0.352*	0.698*	-0.001	0.515
SE17	0.120	0.143*	0.541*	0.417	0.049	-0.218*	0.711*	0.047	0.427
SE18	0.013	0.562*	0.353*	0.542	-0.012	0.288*	0.513*	0.040	0.540
SE19	-0.047	0.473*	0.335*	0.39	-0.090	0.173	0.481*	0.108	0.392
SE20	-0.011	0.556*	0.058	0.323	-0.006	0.445*	0.140	0.052	0.320

*The largest loadings on factors.

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the EGA results. In addition to the displacement of factors in the results of EGA, EGA parametric bootstrap, and EGA nonparametric bootstrap, the displacement of item 16 between different clusters is the main difference. The results from the EFA method (3 and 4 factors) show that items 10 and 11 constitute the fourth factor (same as the EGA nonparametric bootstrap method). Regardless of factor 4, the first factor for the 3 and 4 factors in EFA is the same and the difference is related to the second and third factors.

Confirmatory factor analysis

Since all items have 11 choices, we can consider them continuous with non-normal distribution. Accordingly, CFA was done in lavaan (Rosseel, 2012) with weighted least square mean and variance estimation (Li, 2016). According to Table 5, all models fit the data. The model that has the best fitting is related to EGA based on the nonparametric bootstrap method (EGA.NPB) and 4 factors from EFA (EFA4F). However, content investigation of items shows that factors from the EGA method have theoretical justification and interpretation.

In addition to the model's goodness of fit, other aspects of the models, such as construct reliability and discrimination validity, should be considered for correct score interpretation. Accordingly, the construct reliabilities (composite reliabilities) of factors from different methods along with AVE indices (for discrimination valid-

Table 4. Pattern of items in various clusters (factors) for different methods

Method	Factor 1	Factor 2	Factor 3	Factor 4
EGA	9-12-13-14-15-16-17-18-19	1-2-3-4-6	5-7-8-10-11-20	-
EGA.PB	1-2-3-4-6-16	5-7-8-10-11-20	9-12-13-14-15-17-18-19	-
EGA.NPB	1-2-3-4-6	5-7-8-9-18-19-20	12-13-14-15-16-17	10-11
EFA3F*	1-2-3-4-6	5-7-8-9-10-11-12-13-18-19-20	14-15-16-17	-
EFA4F*	1-2-3-4-6	5-7-8-20	9-12-13-14-15-16-17-18-19	10-11

EGA: exploratory graph analysis; EGA.PB: exploratory graph analysis parametric bootstrap; EGA.NPB: exploratory graph analysis non-parametric bootstrap; EFA3F: exploratory factor analysis 3 factor; EFA4F: exploratory factor analysis 4 factor.

*Item assignment is done based on the maximum factor loading.

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Table 5. Fit indices for all models

Factor	χ^2	df	CFI	GFI	NFI	TLI	RMSEA (CI 90%)	SRMR
1F	601.101	170*	0.939	0.946	0.917	0.932	0.064(0.058-0.070)	0.092
EGA	363.725	167*	0.972	0.967	0.950	0.968	0.044(0.037-0.050)	0.070
EGA.PB	365.451	167*	0.972	0.967	0.950	0.968	0.044(0.038-0.050)	0.071
EGA.NPB	338.943	164*	0.975	0.969	0.953	0.971	0.041(0.035-0.048)	0.067
EFA3F	390.054	167*	0.968	0.965	0.946	0.964	0.046(0.040-0.052)	0.075
EFA4F	344.216	164*	0.974	0.969	0.953	0.970	0.042(0.036-0.048)	0.066

*P<0.0001

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1F: one factor; EGA: exploratory graph analysis; EGA.PB: exploratory graph analysis parametric bootstrap; EGA.NPB: exploratory graph analysis non-parametric bootstrap; EFA3F: exploratory factor analysis, 3 factors; EFA4F: exploratory factor analysis, 4 factors; CFI: comparative fit index; GFI: goodness of fit index; NFI: normed fit index; TLI: Tucker-Lewis index, RMSEA: root mean square error of approximation; SRMR: standardized root mean square residual.

Table 6. Omega, α, and average variance extracted indices for models from the exploratory graph analysis method

Models	Factors					α	Average Variance Extracted
	1	2	3	4	Total		
1F	0.898	-	-	-	-	0.901T	0.310
EGA	0.864	0.727	0.841	-	0.914	0.866-0.748-0.842-0.901T	0.414-0.352-0.470-0.411T
EGA.PB	0.744	0.841	0.859	-	0.913	0.765-0.842-0.859-0.901T	0.330-0.471-0.434-0.405T
EGA. NPB	0.728	0.836	0.828	0.846	0.917	0.748-0.840-0.833-0.842-0.901T	0.353-0.423-0.445-0.734-0.430T
EFA3F	0.727	0.883	0.775	-	0.913	0.748-0.886-0.782-0.901T	0.353-0.408-0.463-0.404T
EFA4F	0.727	0.797	0.864	0.846	0.917T	0.748-0.797-0.866-0.842-0.901T	0.352-0.497-0.414-0.734-0.433T

EGA: exploratory graph analysis; EGA.PB: exploratory graph analysis parametric bootstrap; EGA.NPB: exploratory graph analysis non-parametric bootstrap; EFA3F: exploratory factor analysis 3 factor; EFA4F: exploratory factor analysis 4 factor.

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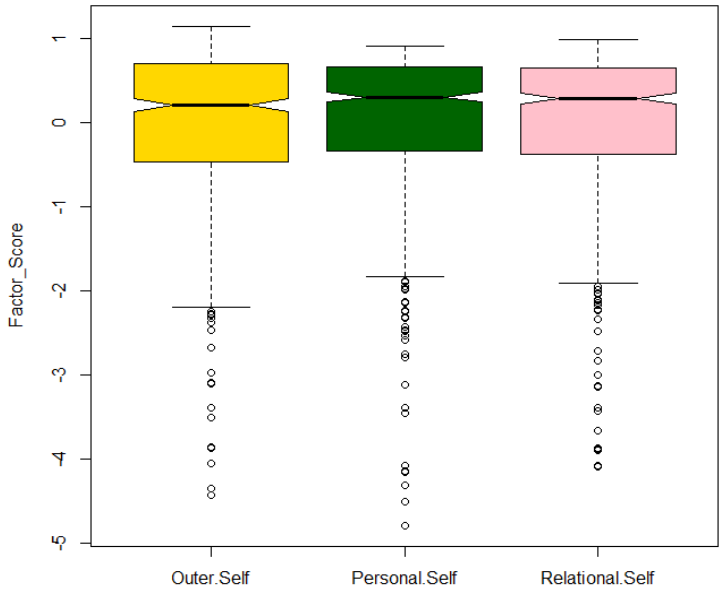

Figure 4. Boxplot for 3 factor scores

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ity) were computed (Table 6). The omega (McDonald, 2013), as a measure of construct reliability, shows a part of the variance of the scale or subscale scores that are explained by a general factor (measured by all items in the scale) or each of the specific factors (measured by some items of the scale). Omega is a model-based reliability method that can be considered an estimation of validity, especially convergent validity.

The problems related to the internal consistency indices, such as α, split-half, and KR20 is that they cannot affect Omega. The α index is a kind of omega if the assumptions of α are to be established (Watkins, 2017). Factors with an omega measure of less than 0.5 should be revised because they are problematic and values equal to or greater than 0.5 are acceptable. Omega values equal to or greater than 0.7 (Hair, Black, Babin & Anderson, 2010) or 0.75 (Reise, 2012) are suitable. While all omega values show convergent validity, AVE indices are below 0.5 for all models. AVE of 0.5 or higher indicates that, on average, the construct explains 50% or more of the variance of its indicators. As Fornell and Larcker (1981) maintained, we can accept 0.4 for AVE because if AVE is less than 0.5 while composite reliability is higher than 0.6, the convergent validity of the construct is still adequate. Accordingly, the AVE for 3 factors from the EGA method is 0.414, 0.352, and 0.470, respectively which show low convergent valid-

Table 7. Correlation coefficients between the subscales of adult sources of self-esteem scale forms A and B and Rosenberg's self-esteem

Subscales	1A	2A	3A	1B	2B	3B	Ro
Outer (A)	1						
Personal (A)	0.481**	1					
Relational (A)	0.387**	0.635**	1				
Outer (B)	0.519**	0.418**	0.401**	1			
Personal (B)	0.312**	0.459**	0.768**	0.587**	1		
Relational (B)	0.445**	0.678**	0.449**	0.593**	0.620**	1	
RSE	0.021	0.090	0.036	0.053	0.082	0.094	1

** Correlation is significant at 0.01 level (2-tailed).

RSE: relative standard error.

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ity for 2 factor. On the other hand, discriminant validity is present when the shared variance within a construct (AVE) always exceeds the shared variance with all other constructs (Hair, et al., 2019). The squared correlations between factors 1 and 2, 1 and 3, and 2 and 3 are 0.36, 0.55, and 0.28, respectively. This shows that the discriminant validity of factors is not high. For 4 factor structure from the EFA (EFA4F) method, the squared correlations between the factors are 0.23, 0.36, 0.25, 0.50, 0.51, and 0.37 respectively. Their AVE is 0.352, 0.497, 0.414, and 0.734, respectively. This shows that discriminant validity in 4 factors structure is comparatively better than 3 factors structure.

To investigate convergent validity, the correlation of ASSEI subscales in forms A and B and Rosenberg's self-esteem are reported in Table 7. Although no significant correlation exists between ASSEI subscales in forms A and B and Rosenberg's self-esteem, the correlation of ASSEI subscales in forms A and B is significant and acceptable. Consequently, based on the boxplot results in Figure 4, the distribution of factor scores in 3 factors is the same with negative skewness. Factor 2 has the largest mean and the lowest dispersion. Although the mean of factors 1 and 3 are approximately equal, the dispersion of factor 3 is more than factor 1.

4. Discussion

The present study aimed to determine different facets of self-esteem in an Iranian sample and to investigate factor analysis of ASSEI. The result of the explanatory analysis has shown that the scale can be 3 or 4 factors in this sample but the 3 factors structure indicated the maximum fitness and justified an interpretation. Based on this analysis, the first factor contained items 1, 2, 3, 4, and 6. The second factor included items 5, 7, 8, 10, 11, and 20. The third factor included items 9, 12, 13, 14, 15, 16, 17, 18, and 19. The first factor related to the outward self, such as appearance and popularity is called the "outer self". The second factor refers to the relational dimension, such as relationships with family and society members and even the relationship with God that we called the "relational self". Consequently, the third factor is related to the personal dimension, such as achievement, intelligence, and abilities that we called the "personal self".

Although the factor structure in the original version is 2 factors, including independent self and interdependent self, Flemind and Olovson (2008) suggested that the number of useful factors is still an open question and the factor structure of the ASSEI in different studies suggests that either 2, or possibly 3 factors may be useful. Meanwhile, when 2 factors are retained, they may be called "independent or individual) self" and "interdependent or relational self". They believe when a third factor is retained, it consists of items related to concern for the impression that one makes on others (physical appearance and physical abilities, grooming, being liked). These traits might be called the "inner", "outer", and "other" aspects of the self as they pertain to the "personal self", "impression on others", and "relational self", respectively.

Considering that sources of self-esteem can be different in different cultures, we explained these factors in the present sample. For example, relationships among family and society members are common in Iran and people define themselves in terms of these relationships. Even it is important that the outer self and the inner self can be influenced. In other words, relational dimensions of self-esteem are substantial for other dimensions of self. Appearance and outer self are important because evaluations of others in social relationships are important. Also, personal achievements can affect these relationships and mutually influence reaching new connections. This explains that relationships are important to self-concept in some Asian cultures. Therefore, it is necessary to pay attention to cultural and individual differences. Recently, research has concentrated more on cross-cultural studies about self-esteem. For example, Lyu et al., (2019) investigated self-esteem among Chines and American students and indicated that American undergraduates had higher self-esteem compared to Chinese undergraduates. Also, Jung and Lee (2009) compared the appearance self-schema, body image, and self-esteem between Korean and American women. They found that Korean women placed greater importance on appearance, were more critical of their bodies, and revealed lower self-esteem compared to their American peers. Therefore, the research can investigate the reasons for differences that sometime may result from used measures or different definitions of self-concept in Asian cultures.

Moreover, the internal consistency of factors by using the Cronbach α method was obtained at 0.90. In addition, the convergent validity of the ASSEI with the Rosenberg self-esteem scale was weak. We suppose that the Rosenberg general self-esteem scale has been used to measure global self-esteem while ASSEI is designed to measure various fields of self-esteem. So, it is better to use measures of self-esteem that are multidimensional for convergent validity.

5. Conclusion

Self-esteem has multiple dimensions and it is better to understand all its aspects. Meanwhile, self-esteem can be different in various cultures because people of different cultures define themselves based on values and criteria that their society determines and the importance of each dimension can be different in every society and culture. This creates a need to use new scales that could be useful in various cultures. Based on our results in this research, we conclude that the factors structures of ASSEI as a self-esteem instrument are 3 factors. Accordingly, the outer and relational self can indicate the importance of social dimensions in the Iranian population. The results can be used in clinical situations and social research to assess what leads individuals to see themselves more or less positively in the Iranian population.

Limitations and future research

The present study faced some limitations. Our sample was from university students and the results cannot be generalized to other Iranian populations, especially considering that there is ethnic diversity in Iran. Also, the number of male participants is less than female participants and all participants were in the age range of 18-35 years. Gender and age can lead to different results on this scale. Although we suggest the scale be used in greater groups that involve different gender and age range along with various ethnicity.

Ethical Considerations

Compliance with ethical guidelines

This research adheres to all applicable standards regarding survey research ethics throughout the data collection, data analysis, and reporting processes.

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Authors' contributions

Conceptualization and Supervision: Negar Sadeghi; Methodology: Balal Izanlu; Investigation, Writing–original draft: Negar Sadeghi; Writing--review & editing: Negar Sadeghi, Balal Izanlu; Data collection: Negar Sadeghi; Data analysis: Balal Izanlu.

Conflict of interest

The authors declare no conflict of interest.

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