

Original Research



# Psychometrics of the Persian version of the scale for assessing the autonomous work behavior of faculty members in Iran

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## Abstract

**Background:** The autonomy of faculty members is vital for making the right decision in their work and professional development. Given the need and lack of appropriate tools to measure the autonomous work behavior of faculty members, the current study was conducted with the collaboration of the faculty members from Shahid Beheshti University of Medical Sciences, aiming at assessing the psychometrics of the Persian version of a scale for assessing autonomous work behavior of faculty members in Iran.

**Methods:** The Persian version of a scale developed by Evers et al was validated in this psychometric study. A total of 480 faculty members were selected using convenience sampling. After translation and cultural adaptation, face and content validity and reliability were checked, and construct validity was calculated using confirmatory factor analysis with Lisrel factor analysis software.

**Results:** Of the 480 study participants, 225 (46.9%) were males, and 255 (53.1%) were females. The mean age of the subjects was  $37.39 \pm 7.58$  years. The majority (360; 75%) had the rank of assistant professor, and 360 (75%) had less than 15 years of work experience. Content validity among 20 experts was 0.88. Confirmatory factor analysis for all 25 items loaded across four factors, and this four-factor scale showed a good fit in the Iranian community. Reliability using Cronbach's alpha was calculated at 0.85, and 0.9 using the test-retest method.

**Conclusion:** The Persian version of this scale has good validity and reliability in Iran and is a useful tool for assessing the autonomous work behavior of faculty members that educational administrators can use.

## Introduction

The study of work behavior in organizations today is part of industrial-organizational psychology, which is knowledge aimed at understanding factors affecting the work behavior of individuals in an organization. This field focuses on gaining an understanding of job performance, job satisfaction, and other factors that affect organizational structure.<sup>1</sup>

In an ever-changing world, organizations, including universities, strive to adapt to their surroundings, therefore, factors such as employees' work autonomy, autonomy, self-discovery, self-awareness, and self-fulfillment are emphasized. Researchers and experts have concluded that the support of managers and leaders of organizations for work independence of employees promotes efficiency, satisfaction, commitment, creativity and innovation, learning, job participation, and performance.<sup>2</sup>

The main characteristics of work independence include autonomy (the person can determine his actions); the person can perform the actions he has determined

properly; one's actions and decisions are based on deep thinking; one's actions and decisions are consistent with one's set of internal laws; and external factors do not limit the individual's decisions. Evidence shows that work independence can improve employee performance.<sup>3</sup> Supporting work independence also affects individual and team learning and teamwork.<sup>4</sup>

In formulating leadership and human resource management strategies, a workforce should be free and autonomous to achieve commitment, development, innovation, production of new products, and organizational learning. The basic premise of work independence is that to achieve psychological well-being and positive outcomes, employed individuals must meet the three requirements of competency, relationship, and autonomy, which simultaneously contribute to job satisfaction.<sup>5</sup>

A job with a high degree of independence helps people feel more responsible for their work. In addition, it creates more satisfaction in people and leads to better

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performance. Work independence causes one to make more effective decisions and choices, have more regulated thoughts and behaviors, solve a problem, and achieve goals based on personal self-awareness and knowledge of his/her strengths and weaknesses.<sup>6</sup>

Evers et al developed a reliable tool for measuring teachers' autonomous work behavior, and various global studies and tools have been used to confirm it. The tool measures the autonomous work behavior of teachers in several areas: primary work processes in the class, curriculum implementation, participation in decision-making at school, and professional development.<sup>7</sup>

Due to the importance of measuring and evaluating autonomous work behavior of teachers and faculty members, and given the lack of appropriate Persian tools in this field, it was decided to conduct tool psychometrics for this study for localization and psychometric assessment of the Evers scale to assess autonomous work behavior of the teachers (faculty members) at the Shahid Beheshti University of Medical Sciences.

## Materials and Methods

### Study design

The current psychometric study consists of the Evers' scale's psychometric properties assessment. Using convenience sampling the statistical population was selected among instructors (faculty members) at the Shahid Beheshti University of Medical Sciences ( $n=480$ ). Since there are 25 items on the scale, a calculation of 20 samples was reached for each item, including standardized confirmatory factor analysis. A total of 480 participants were included to account for missing or incomplete data. Faculty members were recruited from different education centers with various work experiences and academic ranks. This variety of sampling was aimed at reducing bias. All attempts were made to keep the data of all faculty members complete without missing any.

Participants (faculty members) were assured that the information was completely confidential, and individuals participated in the study with complete satisfaction.

### Study setting

We validated the scale from 2019 to 2020 in collaboration with the faculty members at Shahid Beheshti University of Medical Sciences in Iran.

### Research tool

The teacher autonomous work behavior measurement scale has 25 items across 4 dimensions. Each item is scored on a 7-point Likert scale, where 7=strongly agree to 1=strongly disagree. The scale consists of four dimensions: items 1 to 8 (primary work processes in the class), 9 to 15 (curriculum implementation), 16 to 20 (participation in decision-making at school), and items 21 to 25 (professional development). The validity of the autonomous work behavior scale of Evers et al. was above

0.75, and the reliability for each of the four mentioned dimensions was 0.87, 0.89, 0.86, and 0.94, respectively.<sup>7</sup>

For the purposes of social sciences research, a score above 0.7 is considered satisfactory. In this study, after obtaining permission from the developers of the scale, and for its psychometrics in Iran, the following measures were taken:

A translation and cultural adaptation of the English version was done according to the translation and adaptation protocol of the International Quality of Life Assessment (IQOLA) approach. The translation was done from English into Persian by two fluent English translators. Inappropriate phrases or concepts in the translation were identified and eliminated, and differences between the original and translated versions were investigated. Finally, from the combination of the original translations, a final Persian version of the scale was created.<sup>8</sup> All stages, confirmation, and intercultural adaptation with the help of subject matter experts were examined through a survey of 20 expert academic members in medical education and psychometrics. In addition, face validity, content validity ratio (CVR), and content validity index (CVI) were measured. Based on the opinions of expert academic members and calculating the CVR and CVI, an instrument validity was obtained. Content validity among the 20 experts was 0.9.

Construct validity was assessed through confirmatory factor analysis using Lisrel software, and reliability was assessed using Cronbach's alpha and cluster correlation coefficient. Cronbach's alpha and test-retest were used to confirm the reliability and internal consistency.

## Results

A total of 480 faculty members (teachers) of the Shahid Beheshti University of Medical Sciences participated in this study. The minimum age was 30 years, and the maximum was 81 years. The mean age of the participants was 37.4 years (S.D.: 7.58). Table 1 shows the frequency distribution of participants in terms of gender, marital status, academic rank, and work experience.

The reliability test results for the 25-item scale showed good reliability in both phases (ICC < 0.9 intra-cluster correlation coefficient). Results of the test-retest showed a strong and significant correlation between test and re-test phases ( $P < 0.00$ ;  $r = 0.9$ ).

### Results of determining the reliability of the scale using internal consistency

The scale was given to 25 faculty members for the pilot, and the Cronbach's alpha for all items was 0.85. This result shows that the reliability of the tool is high.

Based on the face validity test results, the translated scale was validated by the panel of experts in the first stage, and no questions were removed.

The results of the CVI and CVR from the perspective of experts were as follows: the mean CVR was calculated

**Table 1.** Frequency distribution of demographic variables

Demographic variables		Count	Percent
Gender	Female	255	53.1
	Male	225	46.9
Marital status	Single	102	21.3
	Married	378	78.8
Work experience	Below 15 years	360	75.0
	15-25	96	20.0
	Above 25 years	24	5.0
Academic rank	Assistant professor	360	75.0
	Associate professor	96	20.0
	Professor	24	5.0

to be 0.88. The results of the content validity stage of the scale, taking into account the mean content validity of 0.90 and the CVI of 0.90, resulted in the production of a 25-item scale with no items were omitted.

Construct validity was calculated using confirmatory factor analysis. Findings were analyzed using SPSS software version 19 and Lisrel factor analysis software.

### Results of factor analysis with principal components approach

The Kaiser-Meyer-Olkin test was equal to 0.768, suggesting sampling adequacy. Bartlett's test also showed a significant value. The model fit indices were all acceptable according to Table 2. Extraction of factors using principal component analysis with a specific value greater than one led to the identification of six factors, which explained a total of 68.5% of the total variance. However, the first four factors covered 56.4% of the total variance and thus were selected. Table 3 shows the data distribution in the extracted factors.

### Investigation of factor matrix

Table 4 shows the matrix of rotated factors. This matrix specifies in which dimension each item is located. As can be seen in this table, items 1 to 8 are placed in the first

dimension, 9 to 15 in the second dimension, 16 to 20 in the third dimension, and 21 to 25 in the fourth dimension.

### Investigating the items related to each dimension after factor analysis

Tables 5, 6, 7 and 8 show factor loads above 0.4 for each item based on factor analysis in the respective dimension.

### Reliability after factor analysis

After performing factor analysis and identifying the dimensions, Cronbach's alpha level was re-evaluated to assess the scale's reliability. The highest reliability was related to the dimension of primary work behavior in the class (0.846), and the total reliability of the scale was 0.703.

### Frequency distribution of scores in each dimension

Table 9 shows the mean and standard deviation values for each dimension in addition, to the lowest and highest values. Based on the results, the lowest score and lowest mean were seen in the dimension of participation in decision-making, and the highest score and mean were related to the dimension of primary work processes behavior in the class.

### Comparison of scores across dimensions using Friedman test

As seen in Table 10, the Friedman test shows that there was a significant difference between dimensions from the perspective of faculty members. The dimension of primary behavior in the class is a priority for teachers. In rank order, the remaining priorities were curriculum implementation, professional development, and participation and decision-making, respectively.

### Discussion

The main purpose of this study was to validate a Persian version of a scale to assess the autonomous work behavior of faculty members by examining its psychometric properties. The results of the content validity stage in

**Table 2.** Indexes related to the construct validity and their calculated value

Indexes	CMIN/DF	PNFI	AGFI	GFI	IFI	CFI	RMSEA
Acceptable interval	5-1	<0.5	<0.8	<0.9	<0.9	<0.9	>0.08
Calculated value	2.036	0.79	0.89	0.98	0.97	1	0.0094
Fit status	Yes	No	Yes	No	Yes	Yes	Yes

**Table 3.** Distribution of data in the extracted factors in factor analysis

Total Variance Explained						
Factors	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	Variance percent	cumulative variance	Total	Variance percent	cumulative variance
1	4.928	20.712	20.712	4.928	20.712	20.712
2	3.352	13.408	34.12	3.352	13.408	34.12
3	2.866	12.465	46.585	2.866	12.465	46.585
4	2.332	9.815	56.42	2.332	9.815	56.42

**Table 4.** Matrix of factors

	Factors or dimensions			
	1	2	3	4
a1	0.951	-0.028	0.013	0.096
a2	0.843	-0.072	-0.025	0.094
a3	0.824	-0.068	-0.034	0.111
a4	0.863	-0.041	0.025	0.070
a5	0.651	0.049	-0.014	0.109
a6	0.881	0.016	0.022	0.046
a7	0.955	-0.078	0.003	0.076
a8	0.743	0.108	-0.045	0.064
a9	-0.224	0.752	0.123	0.187
a10	0.094	0.859	-0.360	-0.040
a11	-0.192	0.781	0.037	0.106
a12	-0.170	0.674	0.206	0.013
a13	0.050	0.802	-0.342	-0.073
a14	0.041	0.754	-0.423	0.013
a15	0.109	0.791	-0.313	-0.110
a16	0.132	0.142	0.686	0.178
a17	0.054	0.245	0.538	-0.404
a18	0.027	0.225	0.672	-0.399
a19	0.100	0.140	0.791	0.174
a20	0.023	0.245	0.687	-0.431
a21	0.034	-0.179	0.236	0.784
a22	0.025	0.365	0.134	0.784
a23	0.040	-0.152	0.231	0.626
a24	0.032	0.385	0.133	0.762
a25	0.031	0.370	0.077	0.624

the 25-item scale, taking into account the mean content validity of 0.88 and the CVI of 0.90, resulted in the production of a 25-item scale with no items omitted. The Persian version of the scale showed good content validity and good reliability in both stages. Test-retest results showed a high and significant correlation between the two stages of the test and retest with a Cronbach's alpha of 0.703, an acceptable value. Extraction of factors was selected by principal component analysis with an eigenvalue greater than one, leading to the identification of the first four factors, which covered 56.4% of the total variance.

#### ***Determining autonomous work behavior in university faculty members***

The lowest and highest values obtained in the dimensions were also observed in this study. The lowest score and lowest mean were seen in the dimension of participation in decision-making (19.079), and the highest score and highest mean were related to the dimension of primary work behavior processes in the class (47.812). The Friedman test shows significant differences among dimensions from the perspective of faculty members. According to mean scores, the dimension of primary work behavior processes in the class is a priority for teachers. Following in rank order are curriculum implementation, professional development, and participation in decision-making, respectively.

The results of this study were consistent with Evers and colleagues' study.<sup>7</sup> After selecting the items, they were divided into 4 dimensions of teacher autonomous behavior. The primary instrument included 24 items across the

**Table 5.** Primary work processes behavior in the class

Dimension	Item number	Item	Item load factor
Primary work processes in the class	1	I have a say in the planning of my work activities.	0.951
	2	I have an influence on my pace of work.	0.843
	3	I have a say in the (educational) tasks that are assigned to me.	0.824
	4	I am free to be creative in my teaching approach.	0.863
	5	The selection of student-learning activities in my class is under my control.	0.651
	6	My job does not allow for much discretion on my part.	0.881
	7	I have a say over the scheduling of use of time in my lessons.	0.955
	8	I select the teaching methods and strategies I use with my pupils/ students.	0.743

**Table 6.** Curriculum implementation

Dimension	Item number	Item	Item load factor
Curriculum implementation	9	In my teaching, I use my own guidelines and procedures.	0.752
	10	In my situation, I have little say over the educational content (knowledge and skills) that I am supposed to teach.	0.859
	11	My teaching approach focuses on those goals I select myself.	0.781
	12	What I teach in my lessons is determined for the most part by myself.	0.674
	13	The materials I use in my lessons are chosen for the most part by me.	0.802
	14	The educational content (knowledge and skills) taught in my lessons are those I select.	0.754
	15	The educational content of the skills I teach in my courses is the ones I choose.	0.791

**Table 7.** Participation in decision making at school

Dimension	Item number	Item	Item load factor
Participation in decision making at school	16	I determine what happens at my workplace.	0.686
	17	I co-decide about things that are related to my work.	0.538
	18	I have a say in what does and does not belong to my task.	0.672
	19	I co-decide about the nature of my work activities.	0.791
	20	I have a direct say in the decisions of the school.	0.687

**Table 8.** Professional development

Dimension	Item number	Item	Item load factor
Professional development	21	I have a say in the planning of my professional development activities.	0.784
	22	I have an influence on the pace of my professional development activities.	0.626
	23	I have something to say about the professional development activities I carry out.	0.762
	24	I have a say in which professional development activities I perform I co-decide about the moment at which my professional development activities need to be finished.	0.624
	25	I have a say in how much time I spend on certain professional development activity.	0.784

**Table 9.** Dimensions

	Total number	Minimum	Maximum	Mean	SD	Variance
Dimension 1	480	39	56	47.081	3.4658	12.012
Dimension 2	480	23	38	31.027	3.3334	11.112
Dimension 3	480	14	25	19.079	2.6402	6.971
Dimension 4	480	18	35	27.058	3.0532	9.322

**Table 10.** Comparison of mean scores by dimensions

Dimension	Mean of ranks	P value
Primary behavior at classroom	4	0.000
Curriculum implementation	2.78	
Professional development	2.21	
Participation and decision-making	1.02	

dimensions of the primary work behavior processes in the class, curriculum implementation, participation in school decision-making, and professional development. Content and construct validity was favorable (Figure 1). The reliability of the instrument was obtained using Cronbach's alpha coefficient for each subset of the instrument as 0.87, 0.89, 0.86, and 0.94, respectively, which confirmed the reliability. The results of this study confirmed the 4 dimensions of teachers' autonomous behavior obtained from this study and showed that the instrument used for this study has strong psychometric properties and can be used in other studies to measure teacher's autonomous behavior.<sup>2</sup>

Vangrieken and Kyndt's collaborative study investigated the relationship between independence and cooperation. They evaluated how teachers perceive and value independence, collaboration, and their relationship. Quantitative and qualitative methods were used to gain a deep understanding of these relationships. The qualitative results of the study showed that independence should be divided into aspects related to content and teaching. In addition, while the quantitative research results indicated

a common integrated approach, the qualitative findings showed that the level of cooperation varied according to the scope of independence.<sup>9</sup>

Yin and Wang conducted a study entitled, "Motivation of Employee Knowledge Sharing Behaviors: A Work Independence Perspective". Data from the study were collected using a survey in Taiwan in 2010 involving 34 companies. The results of this study showed that work independence, including personal satisfaction and organizational interests, have a positive effect on organizational shared behaviors.<sup>10</sup>

Saragih investigated the relationship between work independence and job outcomes (job performance, job satisfaction and job stress). This study also examined the effect of job satisfaction on performance. The results of this model showed that work independence is significantly related to job satisfaction and job performance but is not related to job stress. In addition, self-efficacy is part of the relationship between job independence, job satisfaction, and job performance.<sup>11</sup>

Ahmadi et al investigated applying the theory of autonomy in predicting job performance among physical education teachers. The results of this study showed that the theory of autonomy had a good fit among physical education teachers and the three psychological needs of competence, autonomy, and dependence can predict 18% of changes in the job performance of physical education teachers. This study also showed that intrinsic motivation positively affects job performance. On the other hand, psychological needs also had a significant

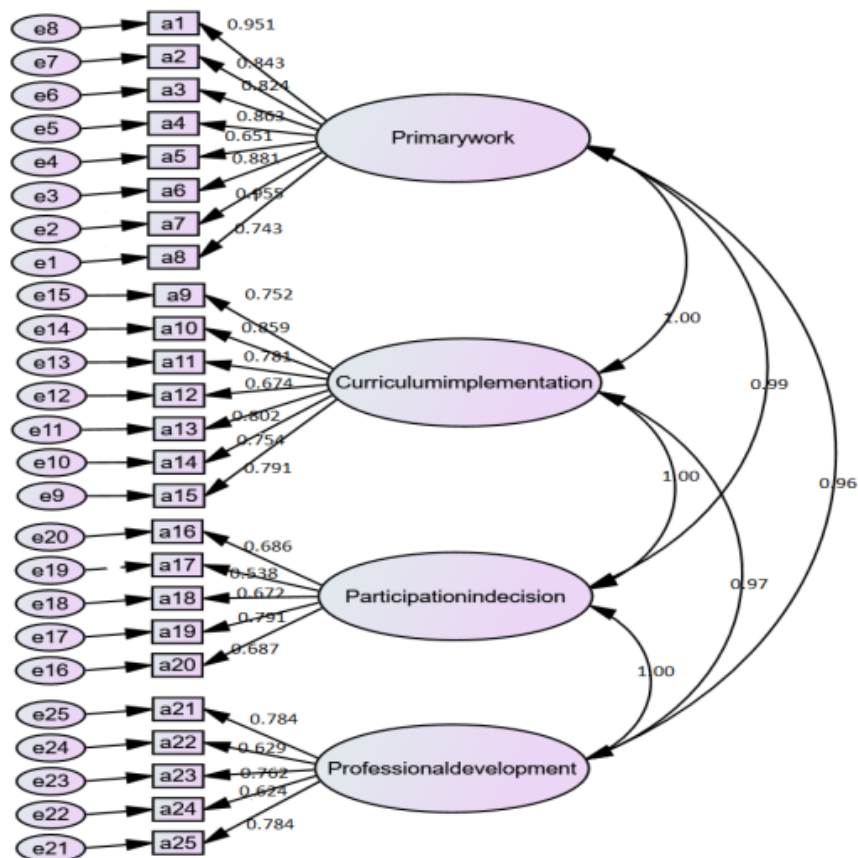


Figure 1. Standardized confirmatory factor analysis diagram.

and positive effect on intrinsic motivation. In general, this study showed that the existence of autonomy, a sense of competence, and having a positive relationship with other teachers in the workplace increases intrinsic motivation and job performance in physical education teachers.<sup>12</sup>

Ghanbari et al found that the direct effect of work independence on individual and organizational performance was positive and significant and the indirect effect of work independence on individual and organizational performance mediated by individual learning was positive and significant.<sup>13</sup>

In general, studies show the application and benefits of autonomous work behavior in promoting the job performance of individuals in the organization. For example, Saragih indicated that work independence affects job outcomes, and self-efficacy can be considered one of the effective dimensions of work independence, and thus, by strengthening it, job independence is improved.<sup>11</sup> Reeve and Jang studied what teachers should teach their students about functional independence during learning activities.<sup>14</sup> NG and Feldman investigated the role of age mediation in the impact of work independence on job outcomes, which can be considered an influential factor.<sup>15</sup> Webb pointed to the role and effect of strengthening and practicing work independence on increasing teachers' performance and considered work independence of teachers as an important factor in increasing the teachers'

social accountability.<sup>16</sup> Runhaar et al emphasized the role and effect of teachers' work independence in their organizational citizen behavior.<sup>17</sup> Evidence emphasizes the need for psychometrics and the production of a Persian version of the tool so that in relying on a reliable tool, the status of this important construct in the country's education system can be carefully examined and evaluated,<sup>18</sup> and can inform decisions and policies in this area<sup>20</sup> based on the results of accurate measurement of autonomous work behavior in the population of faculty members as an important part of the country's higher education human resources.<sup>19</sup> Given that Iran is transitioning from centralized educational systems to semi-centralized and decentralized educational systems, strengthening autonomous work behavior and paving the way for its realization is a step in this direction.<sup>21</sup>

The limitations of this study are as follows. Discriminant validity was not observed for all scale factors when viewed separately and is better considered in other studies. There was an overlap in meaning between some of the factors, and this could limit internal consistency. Therefore, it would be good to examine if the current results replicate across different samples in future studies. This sample only included faculty members from the Shahid Beheshti University of Medical Sciences, meaning that the generalizability of findings to other faculty members and/or non-medical needs to be explored further.

## Conclusion

This study aimed to create a psychometrically valid Persian version of the Evers et al scale to assess autonomous work behavior among university faculty members in Iran. The developed version of the scale was found to be valid, useful, and reliable.

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## Authors' contribution

MAL conceived and designed the study and edited all the different versions of the manuscript and the final paper, and conducted data analyses. AKH participated in recruiting the sample and administering the different instruments and data analysis and contributed to the writing and final editing of the manuscript.

## Ethical approval

The researchers obtained written approval from the Virtual School of Medical Education and Management, Shahid Beheshti University of Medical Sciences, Code of Ethics: IR.SBMU.SME.REC.1398.083.

## Competing interests

The authors declare that they have no financial or non-financial competing interests regarding the publication of this paper.

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