

Value-eroding Teacher Behaviors Scale: A Validity and Reliability Study

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Abstract In the present study, it is aimed to develop a valid and reliable scale for determining value-eroding behaviors of teachers, hence their values of judgment. The items of the ‘Value-eroding Teacher Behaviors Scale’ were designed in the form of 5-point likert type rating scale. The exploratory factor analysis (EFA) was conducted to determine the construct validity of the scale. Afterwards, the validity of the structure obtained through EFA was tested by using the confirmatory factor analysis (CFA). To determine the reliability of the scale, the Cronbach's alpha was calculated, and an item analysis was performed based on the corrected item total correlation. Based on the findings obtained from the validity and reliability studies of the scale, it can be said that the scale is a valid and reliable measuring tool to be used for measuring teachers’ value-eroding behaviors.

Keywords Values, Value-eroding Teacher Behaviors, Teacher Behaviors Scale, Validity, Reliability

1. Introduction

Value can be explained as “the level of relationship, behavior pattern, and perspective that an individual represents/desires to represent when he or she gets in contact with his or her own kind and all other beings beyond and the meaning he or she attributes to the relationship” [1]. Values are principles and standards that guide behaviors and actions, and shape the manners and attitudes of individuals in different situations. Values act as the source of individuals’ correct behaviors by carrying the function of preventing their unapproved behaviors and leading them to obey social norms. Ideally, positive values and attitudes manifest well-adjusted behaviors [2, 3, 4, 5, 6].

There are various research findings which show that teachers’ values influence the students’ behaviors [7, 8, 9, 10, 11, 12]. The values that teachers hold influence their teaching strategies, teaching styles, choices of content,

disciplinary practices, and attitudes and behaviors towards students [13]. At school, children observe numerous things they set out and do not set out to learn and every individual thing they observe contributes to their developing an understanding of good, bad, right, and wrong [14, 15]. If a teacher does not have the values that are desired to be practiced in teaching activities, he might not only fail in being a good model for the students, but he could also cause the values held by students to become dim and even to disappear [16, 17, 18]. For this reason, determining our teachers’ values is considered to be highly important.

Among various methods used for measuring values, one of the two most frequently used tools in social psychology is Rokeach’s List of Values, and the other one is the Value Survey by Schwartz. In our country, there are several studies conducted to determine the values possessed by teachers by using Rokeach’s List of Values and Schwartz’s Value Survey [2, 19, 13, 20, 21, 22, 23, 12]. However, there are only a limited number of scale development studies aimed at determining teachers’ values. The “Pedagogical Values Scale” developed by Tomul and Çelik (2014) [24] consists of 42 items determined by Husu and Tirri (2007) and three factors named as “social, individual and relational values”. Tunca and Sağlam (2013) [25] developed the “Teachers’ Professional Values Scale” consisting of four factors as “showing respect to differences”, “individual and social responsibility”, “being against violence”, and “being open to cooperation” for primary school teachers. The “Moral Virtues Scale” developed by Balay (2011) [26] to determine the moral value orientations of preservice teachers consists of the factors of respect, justice, loyalty, courage, honesty, grace, and trust. In addition, there is the “Teachers’ Ethical Values Scale according to Student Perception” developed by Gündüz and Coşkun (2012) [27].

A review of literature shows that there is no measuring tool that was developed by using teachers exclusively as sample and that evaluates the professional and ethical values that primary, secondary, and high school teachers are required to have through a holistic perspective. It is considered that the development of a standard measuring

tool for measuring teachers' values from the perspective of teachers will contribute to filling this gap in the literature. Based on this need, in the present study, it is aimed to develop a valid and reliable scale for determining value-eroding behaviors of teachers, hence their values of judgment.

2. Method

2.1. Study Group

Exploratory and confirmatory factor analyses of the "Value-eroding Teacher Behaviors Scale" were conducted on different samples. The exploratory factor analysis of the scale was conducted on 310 teachers who worked at primary, secondary, and high schools in the province center of Düzce in the academic year of 2014-2015. In the group, 58.38% of the participants were female (n=181) and 41.61% were male (n=140).

The confirmatory factor analysis of the scale was conducted on 349 teachers who worked at primary, secondary, and high schools in the province center of Düzce in the academic year of 2015-2016. In the group, 59.31% of the participants were female (n=207) and 40.69% were male (n=142). Tabachnick and Fidell (2007) [28] regard a sample size of 300 as "good", 500 as "very good", and 1000 as "excellent" for factor analysis. According to these criteria, it can be said that the sample size of the present study was appropriate for factor analysis.

2.2. Data Collection and Analysis

The first step of the item writing stage of the study was to review the related literature. Besides, the qualitative studies of the researchers entitled "A Study of Teacher Behaviors in Terms of Values Education Based on Teachers' Opinions" and "The Impact of Primary School Teachers on Shaping the Future of Individuals" were also taken as reference for item writing. Within the scope of the mentioned research, semi-structured interviews were conducted on 12 teachers working at primary, secondary, and high schools. As a result, it was found that the negative teacher behaviors that were grouped under 22 categories eroded 10 core values. A question pool of 72 items was created by the three researchers by considering the results obtained in the mentioned study and the related literature.

One of the most commonly used methods for determining the content validity of scales is to take the opinions of experts [29]. For this purpose, the draft scale items were sent to three experts to be assessed in terms of content. The experts were asked to assess the items as "applicable", "inapplicable", and "needs revision" and to write the reasons for their evaluations in the explanation sections given next to the items. After revising some of the items based on the opinions of the experts and taking four items out of the scale, a final

trial form consisting of 68 items was created. The items of the scale were designed in the form of 5-point Likert type rating scale. The scale items were organized in the form of "1- I completely agree", "2 - I agree", "3 - I am not sure", "4 - I disagree" and "5 - I completely disagree".

The exploratory factor analysis (EFA) was conducted to determine the construct validity of the scale. Afterwards, the validity of the structure obtained through EFA was tested by using the confirmatory factor analysis (CFA). To determine the reliability of the scale, the Cronbach's alpha internal consistency reliability coefficient was calculated, and an item analysis was performed based on the corrected item total correlation.

3. Findings

3.1. Exploratory Factor Analysis

Factor analysis is a multivariate statistical method used to get lower number of uncorrelated variables from a large set of correlated variables. The exploratory factor analysis is a technique that is used to identify the underlying relationships between measured variables and to explore the underlining theoretical structure of the phenomena [30].

For testing the construct validity of the scale, first, the Kaiser-Meyer-Olkin and Barlett's tests were implemented and the results of these tests were found to be statistically significant (KMO = 0.861 and $p < 0.01$). According to Hutcheson and Sofroniou (1999) [31], a KMO value between 0.8 and 0.9 indicates a very good sample size. The significance of Bartlett's values show that the data come from a multivariate normal distribution. Based on these values, it was decided that the exploratory factor analysis could be applied to the data.

When deciding on the number of factors, as a practical approach it can be preferred to examine the data and to obtain a factor structure that provides the best explanation of the data by trial [32]. In order to decide on the factor structure of the scale, both the single-factor structure and the multi-factor structures (2, 3, 4, 5, 6, 7, 8, 9, 10) were examined by exploratory factor analysis and the obtained structures were theoretically evaluated. It was seen that other than the five-factor structure, the scale items were not clustered under the related factor structures in a statistically and theoretically significant way.

In recent years, there are two methods that are used and suggested for determining the number of factors in factor analysis. These are "Velicer's MAP Test" and "Horn's Parallel Analysis". In the simulation studies conducted by Velicer et al., it was stated that these two methods yielded the most correct results in determining the number of factors and it was suggested that Horn's Parallel Analysis should be used together with Velicer's MAP Test in determining the number of factors [33].

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PARALLEL ANALYSIS:

Specifications for this Run:
Ncases      300
Nvars       68
Ndatsets    1000
Percent     95

      Root      Raw Data      Means      Prcntyle
1,000000    13,432977    2,090882    2,185545
2,000000     3,792649    1,999037    2,068183
3,000000     3,282834    1,927358    1,986001
4,000000     2,273397    1,868491    1,923250
5,000000     2,038131    1,813999    1,863387
6,000000     1,816815    1,765364    1,810755
7,000000     1,595300    1,719330    1,764559
8,000000     1,477421    1,675910    1,717962
9,000000     1,468932    1,635564    1,676739
10,000000    1,403073    1,597813    1,635551

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Figure 1. The Results of The Horn's Parallel Analysis

Horn's Parallel Analysis is a method developed in order to determine the number of factors through generating random variables. Randomly generated variables and the eigenvalues computed based on the existing variables are calculated separately. Selection is performed in a way that the eigenvalues related to the variables in the existing dataset are bigger than the expected value of the eigenvalues obtained from the randomly selected variables. The number of factors determined will be the number of eigenvalues selected [34]. The Horn's Parallel Analysis conducted in our study showed that there was a small difference between the value generated for the 6th factor (1.816) and the value from the dataset (1.810). In this case, it would be possible to determine the number of factors as 6 or 5. The results of the Horn's Parallel Analysis are presented in Figure 1.

Velicer's MAP Test is based on the examination of a series of partial correlation matrices and principle component analysis. The lowest level of the eigenvalues for the squares of the partial correlation values gives the number of factors [35]. It can be seen that according to the MAP test the suggested number of factors was found as five. When the results of these two tests are evaluated together, it was considered appropriate to determine the number of factors as five. The results of the Velicer's MAP Test are shown in Figure 2.

Although the load value of an item is expected to be 0.45 or bigger when determining the factor structure of a scale, the reduction of this value until 0.30 is also regarded as acceptable [29]. High factor loads are seen as an indicator of the possibility that the variable may fall under the said factor. In the present study, item load values were taken as minimum 0.45.

In the exploratory factor analysis, the factor structure of the study was determined by using the "principal components analysis" and "varimax rotation" as a vertical rotation technique. Principal component analysis is one of the most commonly used multivariate tools to describe and summarize large data sets by finding the subspace in the space of the original variables where the data most vary. In Principal component analysis, the possibly correlated original variables are converted into sets of linearly uncorrelated variables called principal components which are in number less or equal than the number of original variables [36]. Factor rotation involves a transformation of the initial factor loadings so that a greater simple structure is obtained thus creating a more interpretable solution. This transformation does not change underlying mathematical relationship in the data thereby keeping the overall fit of the factor analysis result intact [37]. Varimax rotation ensures that each variable is maximally correlated with only one principal component while having a near-zero association with the other components [38].

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Velicer's Minimum Average Partial (MAP) Test:

Average Partial Correlations

      squared      power4
,0000      ,0410      ,0036
1,0000      ,0099      ,0005
2,0000      ,0084      ,0003
3,0000      ,0071      ,0002
4,0000      ,0067      ,0002
5,0000      ,0065      ,0001
6,0000      ,0065      ,0001
7,0000      ,0066      ,0001
8,0000      ,0068      ,0001
9,0000      ,0070      ,0001
10,0000     ,0072      ,0002

The smallest average squared partial correlation is ,0065
The smallest average 4rth power partial correlation is ,0001
The Number of Components According to the Original (1976) MAP Test is 5

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Figure 2. The Results of the Velicer's MAP Test

The number of factors was determined as five and the load value was determined as 0.45. Afterwards, exploratory factor analysis was performed and a scale consisting of 27 items under a total of five factors was created. It was seen that these 27 items explained the 51.06% of the total variance. The findings regarding the factor loads of the scale and the variance rates that these factors explain are shown in Table 1.

Table 1. Rotated Component Matrix

	Component				
	1. Factor	2. Factor	3. Factor	4. Factor	5. Factor
M67	,774				
M66	,723				
M60	,674				
M59	,666				
M68	,663				
M50	,583				
M52	,574				
M30	,550				
M55	,478				
M6		,769			
M4		,710			
M5		,705			
M8		,705			
M3		,642			
M9		,601			
M12			,798		
M11			,760		
M15			,731		
M14			,606		
M18			,570		
M37				,685	
M44				,672	
M39				,589	
M31					,745
M33					,699
M21					,573
M29					,558

The factors were named based on the statements of the items that were grouped under the same factor. The names of the factors and the items gathered under each factor are shown in Table 2.

Table 2. The Names of the Factors and the Items Gathered under Each Factor

Factor Names	Items
Responsibility and Setting an Example	<p>I find it normal when promises made to the students cannot be kept.</p> <p>I think that the only responsibility of teachers is to teach and leave the classroom.</p> <p>I find it normal when teachers do not stand watch although they are on duty.</p> <p>I think there is no harm if teachers deal with their personal matters in class.</p> <p>I find it normal when teachers are 5-10 minutes late to class.</p> <p>I think teachers do not have to act as a model for students outside the school.</p> <p>I think teachers are not responsible for students' failures.</p> <p>I see no harm if students see their teachers smoking.</p> <p>I think there is no need to limit the relationships with students from the opposite sex.</p>
Fairness in Relationships with Students	<p>I think that if students have different views, this would affect the teachers' attitudes towards them.</p> <p>I think that the socio-economic conditions of the students affect the relationships of teachers with them.</p> <p>I think that the gender of the students affects the attitudes of teachers towards them.</p> <p>I think that the socio-economic conditions of the students are effective in the punishments they will receive.</p> <p>I think the gender of the students should have an effect on the punishments they receive.</p> <p>I think that the socio-economic conditions of the students are effective in rewarding their success.</p>
Fairness in Evaluating Students	<p>I find it normal that students cheat in the exams as long as they do not get caught.</p> <p>I do not find it wrong to increase the exam grades of students to make the level of achievement look higher.</p> <p>I think the issue of cheating is not something that should be exaggerated.</p> <p>I think students' cheating in the exams can be tolerated.</p> <p>I do not find it wrong to give the exam questions beforehand to make the students successful in the exam.</p>
Modesty	<p>I find it natural that when some teachers come into prominence with their achievements, this annoys the other teachers.</p> <p>I find it natural that teachers do not want to be criticized.</p> <p>I find it natural that teachers avoid asking for help from their colleagues regarding the issues they find difficult.</p>
Patience and Sincerity	<p>I find it natural that students are shouted at when they deserve it.</p> <p>I approve suppressing the students in order to maintain the discipline in the classroom.</p> <p>I think it is normal that teachers have conflicts with each other.</p> <p>I find it normal that first impressions influence teachers' behaviors towards each other.</p>

3.2. Confirmatory Factor Analysis

Table 3. Confirmatory Factor Analysis Results

Compliance Criteria	Values
X^2	494.87
sd	314
X^2/sd	1.57
p-Value	0.000
RMSEA	0.041
NFI	0.87
NNFI	0.94
RMR	0.052
GFI	0.90
AGFI	0.89
CFI	0.95

The model that was formed as the result of the exploratory factor analysis was tested through the confirmatory factor analysis. Confirmatory factor analysis is used to test whether the data fit a hypothesized measurement model. This hypothesized model is based on theory and/or previous analytic research [28]. As the result of the analyses, the fit values calculated regarding the convenience of the model are given in Table 3.

When the values given above are examined, it can be said that all the values were considerably good and within acceptable fit limits according to the fit index limits stated by Şimşek (2007) [39]. The ratio of the chi-square value (494.87) to the degree of freedom (314) ($X^2/sd=1.57$) was below 2, which indicates a fairly good fit. The diagram regarding the confirmatory factor analysis is presented in Figure 3.

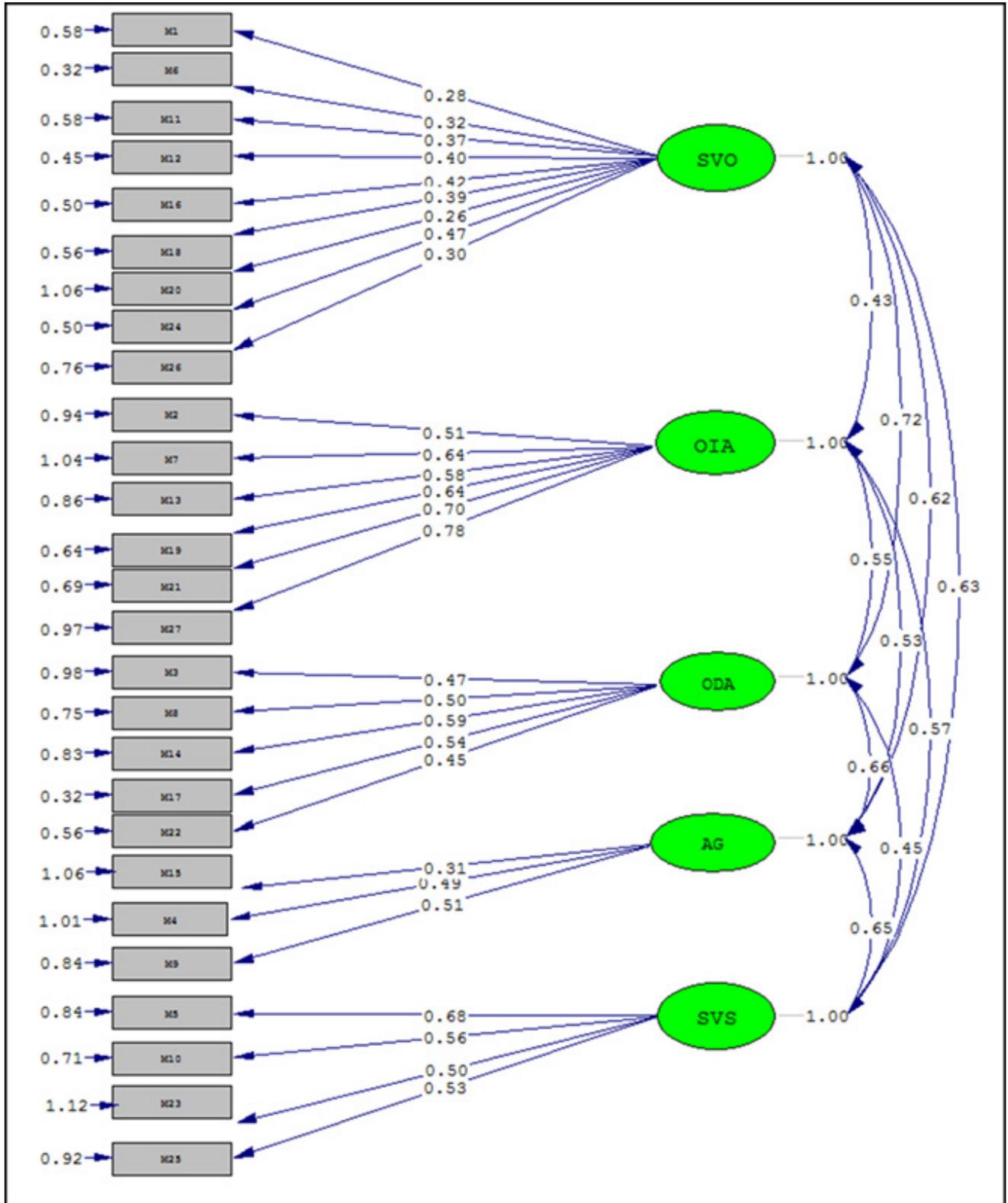


Figure 3. Confirmatory Factor Analysis Path Diagram

3.3. Item Total Correlation

An item analysis was conducted based on item total correlation in order to ensure the internal reliability of the scale. Item statistics point out to the relationship between

the value each item in the measuring tool takes and the total value taken from the entire measuring tool. In a scale, items with a value above 0.20 are regarded to be at an acceptable level and values above 0.30 are interpreted to be at a good level. Besides, although not a definite rule, item total

correlations are expected to be not negative for the additivity of the scale [40, 41].

In the present study, the item analysis was conducted to check the presence of items that showed a significant correlation with the scale scores at a level of 0.20 and above. As the result of the item total correlation analysis conducted for 27 items, it was seen that none of the items were below 0.2, and the lowest item correlation coefficient was 0.235. The correlations between the score series of each item and the total score of the scale are shown in Table 4.

3.4. Cronbach's Alpha

In the internal consistency analysis of the scale, which consisted of 27 items in its final form, the Cronbach's Alpha coefficient was calculated as 0.846. Cronbach's Alpha reliability coefficient is an indicator of the internal consistency among the test scores of the scale, and a value of 0.70 or higher is accepted to be adequate for the reliability of the scale [29]. According to the findings, it can be said that the scale is adequately reliable.

Table 4. Corrected Item-Total Correlation Results

	Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
M30	100,07	151,699	,557	,472	,836
M50	100,09	153,310	,497	,380	,838
M52	100,22	152,722	,448	,341	,839
M55	100,77	157,189	,235	,253	,846
M59	100,21	150,996	,507	,450	,837
M60	100,00	152,746	,518	,493	,838
M66	100,06	153,127	,481	,439	,839
M67	100,14	152,913	,437	,477	,839
M68	100,20	154,552	,359	,383	,842
M3	100,70	151,983	,337	,359	,843
M4	100,51	154,772	,284	,410	,845
M5	100,41	152,789	,370	,387	,841
M6	100,91	152,463	,324	,459	,844
M8	100,64	151,203	,413	,434	,840
M9	100,68	153,163	,335	,329	,843
M11	100,33	150,334	,453	,512	,838
M12	100,19	152,151	,439	,544	,839
M14	100,20	152,910	,412	,342	,840
M15	100,47	151,097	,449	,423	,839
M18	100,16	151,867	,493	,383	,838
M37	100,59	152,503	,411	,339	,840
M39	100,36	154,504	,328	,248	,843
M44	100,76	156,429	,272	,253	,844
M21	101,30	154,445	,288	,239	,845
M29	100,63	155,499	,317	,303	,843
M31	100,89	156,127	,236	,268	,846
M33	101,06	156,055	,246	,271	,846

Cronbach's Alpha coefficients of the factors of the scale were also separately calculated. A Cronbach's Alpha value lower than 0.50 indicates low reliability, a value between 0.50 and 0.80 indicates appropriate reliability, and a value higher than 0.80 shows that the scale has high reliability [42]. In this case, it can be said that the 1st factor had high reliability, whereas the other factors had appropriate reliability levels. It can be stated that the low internal consistency coefficients of the 4th and the 5th factors compared to other factors was related to the small number of the items in these factors. The Cronbach's Alpha coefficients of the factors of the scale are given in Table 5.

Table 5. The Cronbach's Alpha Coefficients of the Factors

Factors	Item No	Cronbach's Alpha
1. Factor	30, 50, 52, 55, 59, 60, 66, 67, 68	,841
2. Factor	3, 4, 5, 6, 8, 9	,792
3. Factor	11, 12, 14, 15, 18	,790
4. Factor	37, 39, 44	,567
5. Factor	21, 29, 31, 33	,604

4. Conclusions

The aim of the present study was to develop a valid and reliable scale to evaluate the value-eroding behaviors of teachers, hence the professional and ethical values that teachers are required to have through a holistic perspective.

The items of the Value-eroding Teacher Behaviors Scale, which initially consisted of 68 items, were designed in the form of 5-point Likert type rating scale. Since the scale consisted of entirely negative items, these were scored in the form of 1 - I completely agree, 2 - I agree, 3 - I am not sure, 4 - I disagree and 5 - I completely disagree. The draft scale was conducted on 310 teachers, and validity and reliability analyses of the scale were performed on the data obtained from this trial procedure.

As the result of the exploratory factor analysis, the number of the items of the Value-eroding Teacher Behaviors Scale decreased to 27. It was seen that the items were grouped under the factors of "responsibility and setting an example" (9 items), "fairness in relationships with students" (6 items), "fairness in evaluating students" (5 items), "modesty" (3 items) and "patience and sincerity" (4 items). These five factors explained the 51.06% of the total variance.

The 27-item scale was reapplied to a different sample in order to confirm the scale structure, and the construct validity of the scale was tested by using confirmatory factor analysis. All the results obtained from the confirmatory factor analysis were found to be considerably good and the model fit was at an acceptable level ($X^2/sd=1.57$, $RMSEA=0.041$, $NFI=0.87$, $NNFI=0.94$, $RMR=0.052$, $GFI=0.90$, $AGFI=0.89$, $CFI=0.95$). Besides, the internal consistency reliability coefficients of the scale were calculated, and the results showed that the scale had a good level of reliability (item total correlation coefficients were

higher than 0.2 and the Cronbach's Alpha coefficient was .846).

Based on the findings obtained from the validity and reliability studies of the Value-eroding Teacher Behaviors Scale, it can be said that the scale is a valid and reliable measuring tool to be used for measuring teachers' value-eroding behaviors.

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