Development of the Perceived Middle School Teacher Behavior Scale

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Abstract

The present study aimed to develop a measurement instrument to determine the perceptions of middle school students on their teachers' behavior. The draft scale, developed as a result of the review of the relevant literature, collection of expert views and a pilot scheme, was applied to the students attending different grades in state middle schools under Malatya Provincial Directorate of National Education during the second semester of the 2014-2015 academic year. It was considered that middle school students possessed the ability to make selections, could distinguish good and bad and right and wrong due to their age group. To determine the scale content and face validity, expert views were obtained and for construct validity, Exploratory Factor Analysis (AFA) and Confirmatory Factor Analysis (CFA) were conducted. Teacher behaviors were categorized as indifferent teacher and authoritative teacher behavior based on the revealed factors. Findings obtained with the implementation of CFA revealed that the Perceived Middle School Teacher Behavior Scale (PMSTBS) construct had adequate fitness indices. It was found that the Pearson Correlation Coefficient between the scores obtained with the test-retest method was 0.86. Thus, it was observed that PTBS was a measurement tool that produced valid and reliable measurements and it was adequate to use the scale with middle school students to measure their perceptions on teacher behavior.

Keywords: Teacher Behavior, Scale Development, Perceived Middle School Teacher Behavior Scale

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Introduction

The school is one of the most common social institutions of our time. Although the schooling times vary across countries, schooling is compulsory in almost every country (Beare, Caldwell, & Millikan, 1989). Primary education, which covers the initial years of schooling, aims to raise awareness about the basic principles of life and the world among children. Social courses provided in middle school aim the children to recognize social events, and science courses aim the children to comprehend natural phenomena. Higher education, on the other hand, allows the individual to become a professional to earn her or his life. A well-organized education also helps promote the development and recognition of new interests by the individual. It improves the selectivity of the individual (Baltas, 1993). One of the factors that influence the selectivity is the achievements at school. School achievement is the progress that the individual demonstrates in achieving predetermined goals based on the school, the grade and the course. However, it is observed that the concept of achievement in the contemporary sense cannot be limited to academic achievements, but also includes cognitive behavior such as knowledge and skills, as well as non-cognitive behavior such as interests, personality traits and attitudes. The attitude of the student towards the teacher, the way that the student perceives the teacher, also affects the student's achievements in the course (Eryaman, 2007; Dokuz & Üreyen, 2010). For instance, unequal treatment of the students by a teacher, differences among the attitudes of the teacher between the students, favoring certain students would adversely affect the interests and achievements of the other students (Çelik, 2003). In such a case, the other students might start to exhibit negative behavior in order to attract the attention of the teacher (Arı & Deniz, 2006). Thus, the teacher's attitude in the classroom affects student perceptions and behavior.

If the student perceives the teacher as someone who emotionally understands her or him, his/her participation in the class improves, and this in turn facilitates learning (Kaya, 2002). It is necessary for the teacher to express himself / herself and her/his expectations clearly in order to be understood accurately by the students in the class (Başar, 2003). In contemporary education systems, it may be necessary to include the perceived teacher behavior in the task of increasing student motivation especially in process-based education systems because the teacher's enthusiasm in daily behavior would affect the motivation of the students (Çelik, 2003).

Today, it is known that several private schools pay each teacher a different wage in their contracts. Private hospitals employ medical doctors with different wages. The fact that several businesses employ individuals with different wages is not just because these individuals are very good technical staff, but also due to the impact of the impression they leave and their perceptions about these individuals on the determination of their salaries and on their acceptance. In a study by Zelyurt on 'Reasons for Failure of 2nd Level and Middle School Students in Courses' conducted in 2011, it was

observed that the most important reason for failure was the avoidance of asking questions to the teachers on topics that middle school students could not understand. This would lead to the conclusion that an attempt should be made to change perceived teacher attitudes instead of a system change. In order for the students to perceive teacher behavior accurately, healthy communications should be established between the teacher and the student. The teacher should be a good listener, could empathize during the communication process, could make the students participate voluntarily in classroom activities and use gestures and mimics effectively (Küçükahmet, 2000).

There are in-classroom and out-of-classroom factors that affect student behavior. One of the in-classroom factors is teacher behavior and traits. Teachers' attitudes and behavior, their values, emotional state, interest in the profession, and knowledge are factors that affect active teaching. The teacher facilitates students' learning through good planning and classroom management. Personal traits of an active teacher could be listed as below (Kaya, 2002):

1. Motivating personality
   - Enthusiasm
   - Intimacy and humor
   - Reliability
2. Dedication to achievement
   - High achievement expectations
   - Inspirational and supportive
3. Professional conduct
   - Serious, systematic
   - Adaptive/Flexible
   - Knowledgeable

Active teacher behaviors are as below (Kaya, 2002):
1. Instruction of the course with enthusiasm.
2. Being productive and dedicated to the profession.
3. Ability to utilize various instructional material and methods.
4. Ability to present a topic in a comprehensible manner.
5. Creating opportunities for the students to realize learning.

The teacher's instructional style influences the orientation of the students to the course and extracurricular activities. When the teacher instructs the course in a way to include all students, undesired behavior could be averted (Kaya, 2002).

Teachers exhibit several behaviors in the classroom. The impact of these behaviors on students is sometimes as expected by the teacher, and in other cases, it is the opposite. To understand the reasons for this outcome, it is quite important to recognize the perceptions of the students about their

teacher. Assessments based on the student perspective could improve the curriculum, teacher behavior, and interactions in the classroom. Furthermore, teacher behavior could also affect students' school choices. Thus, the current study aimed to determine the perceptions of middle school students on teacher behavior. Since there is no scale developed to measure student perceptions on teacher behavior in the literature, the study was considered to contribute to the field literature.

Method

Research Design

Since the present study aimed to develop a valid and reliable scale that could be used to describe the teacher behavior as perceived by middle school students, it was designed as a scale development study.

The first study group. Survey model, one of the descriptive research methods, was used in the study. Descriptive method is preferred to describe a given situation as precisely as possible (Büyüköztürk, Kılıç Çakmak, Erkan Akgün, Karadeniz, Demirel, 2010). The study population included middle school students attending different public middle schools during the second semester of the 2014-2015 academic year. The sample size was calculated by power analysis. The study sample included sufficient number of middle school students to represent the population. A total of 1658 student data were analyzed after the scale was applied to the students and the erroneous and / or incomplete forms were excluded from the analysis. In the present study, it was observed that 52.5% (*N*= 871) of the students were male and 47.5% (*N*= 787) were female; 25.5% (*N*= 423) of the students were in the fifth grade, 23.9% (*N*= 397) were in the sixth grade, 25.9% (*N*= 430) were in the seventh grade and 24.6% (*N*= 408) were in the eighth grade.

The second study group. To obtain more healthy results, a second study group for confirmatory factor analysis followed by the exploratory factor analysis was required (Henson & Roberts, 2006). This study group was determined so that it would include a similar sample when compared to the previous study group. Thus, students attending various public middle schools in Malatya during the first semester of the 2015-2016 academic year were included in this study group as well. A total of 257 student data were analyzed after the scale was applied to the students and the erroneous and / or incomplete forms were excluded from the analysis. It was observed that 54.9% (*N*= 141) of the students in the second study group were male, 45.1% (*N*= 116) were female; 24.1% (*N*= 62) of the students were in the fifth grade, 25.7% (*N*= 66) were in the sixth grade, 24.9% (*N*= 64) were in the seventh grade, and 25.3% (*N*= 65) were in the eighth grade.

Development of The Data Collection Instrument

During the development of the "Perceived Middle School Teacher Behavior Scale" by middle school students, scale items were developed, scope validity was determined, a pilot scheme was conducted, construct validity and reliability of the scale were determined (Balcı, 1995).

Item pool. In order to develop questions for the study item pool, a literature review on middle school student traits, teacher types, classroom management styles, student failures and motivation was initially carried out. On the other hand, the previously developed similar scales were examined (Albayrak, Güngören, & Horzum, 2014; Atik & Üstüner, 2014; Baykara Pehlivan, 2005; Çağlar, Yakut, & Karadağ, 2005; Kara, İzci, Köksalan, & Zelyurt, 2015; Karadağ, Baloğlu, & Yalçınkayalar, 2006; Nartgün, 2008; Özer, Gençtadime, &6 Ergene, 2011; Saydam & Telli, 2011). Furthermore, 20 middle school students were asked to write an essay on "how the teachers should behave" and 80 draft items were developed based on the student responses. In the next stage, graduate students and middle school teachers were asked to analyze the developed items and items were eliminated or added based on these analyses. An attempt was made to ensure that the statements provided content validity initially. Based on the analyses provided by the students and the teachers, the items in the pool were pre-filtered. As a result, 30 items were included in the item pool. As described in the scale title, the scale that aimed to measure perceived teacher behavior by the students was a 5-point Likert type scale using the following scores: "I completely disagree: 1, I disagree: 2, Undecided: 3, I somewhat agree: 4 and I agree: 5 points".

Expert opinion (content validity). The items in the pool were presented to eight faculty members that included two educational program specialists, three educational psychologists and three educational administration specialists to obtain their views. Furthermore, support was provided by two faculty members in the field of Turkish Language Teaching in order to ensure that the prepared material was comprehensible and reflected a clear and common meaning, adhering to linguistic rules.

Pilot scheme. A pilot scheme was conducted using the draft scale developed in accordance with the views of several experts with 120 fifth, sixth, seventh and eighth grade students, and the students were asked to determine the items that were difficult to comprehend. All the items identified to be difficult to understand were reorganized based on student views and with the support of the experts. As a result of the pilot scheme, the " Perceived Middle School Teacher Behavior Scale" that included 30 draft items was finalized for the pilot scheme application. After obtaining the expert views and conducting pilot scheme, the scale was applied to a total of 1658 students in different grades attending different public middle schools to collect the study data.

Factor analysis. Factor analysis was conducted after the scale was applied to 1658 students. It was observed that 52.5% (871) of the sample were male and 47.5% (787) of the sample were female students. Based on the analysis results, the items with construct validity were included in the final scale. In the factor analysis, it was noted that the Kaiser-Meyer-Olkins (KMO) values were high.

Determination of the scale reliability. After the factor analysis was conducted, the Cronbach Alpha internal consistency coefficient was calculated for the finalized scale. To avoid any mistakes, all operations were repeated twice under the supervision of three field experts until the operations

conducted by the two field experts separately provided the same result. The Cronbach Alpha coefficient of more than .70 is sufficient for reliability (Bayram, 2004; Bursal, 2017). In order to improve the internal consistency of the scale by excluding the variables that do not reflect the desired common value, which the study aimed to measure from the analysis, reliability tests were first applied on a factor basis to all variables and then applied to all variables (Baş, 2005). In the analysis phase, Item Total Correlation and Cronbach Alpha were used in the determination of the values that do not reflect the common value that would be measured. The operations performed in the SPPS 21.0 software were repeated until no statements that adversely affected the reliability of each factor were left. Then, in the second stage, all factors were tested again. At the end of the analysis, 36 items were excluded from the scale that originally contained 60 items.

Findings and Interpretation

Exploratory Factor Analysis

The scale developed to determine the perceptions of middle school students on the in-classroom behavior, attitudes and the styles of their teachers was named the "Perceived Middle School Teacher Behavior Scale". The draft scale included 60 items before the factor analysis and 50 statements were eliminated in the analysis.

Table 1. Factor Loadings Values

	Item Factor Loads
4- My teacher does not award me	,562
5- My teacher acts nervous	,507
6- I cannot talk about my problems with my teacher	,484
9- My teacher blames me for everything	,440
13- My teacher reprimands me	,501
15- I do not like my teacher	,466
16- My teacher does not care about me	,594
17- My teacher does not help me	,519
26- My teacher does not like me	,495
30- My teacher does not support me	,534

Factor loads for the final scale ranged between .44 and .594 (Table 1). As a result of the factor analysis, it was found that the "Perceived Middle School Teacher Behavior Scale" with 10 items was a valid scale (Nunally & Bernstein, 1994). Factor analysis conducted on the scale revealed two sub-dimensions. Internal consistency Cronbach Alpha coefficients for the two sub-dimensions are presented in Table 2. Based on these values, it was concluded that the scale was reliable.

Table 2. Reliability and Validity of the Scale

Item Factor Loads	Factor 1	Factor 2	Total
Cronbach Alpha	,829	,529	,823
KMO	,862	,612	,883
Bartlett Test of Sphericity	3560,265	344,689	4476,463
Number of Valid Items	7	3	10

Scale KMO values, the Bartlett test and the Cronbach Alpha internal consistency coefficient were calculated for scale sub-dimensions. As a result of the factor analysis, the statements in the sub-dimensions were examined and the sub-dimensions were named with the support of various middle school teachers, faculty members and the students. Attention was paid to the fact that both subscale and the overall scale KMO values were higher than.75 and that the Bartlett test was significant (p <0.05) (Büyüköztürk, 2004). Factor analysis was repeated after eliminating the items where the factor load was not greater than .40 and that the difference between the item loads of the scale with two subdimensions was not less than .20 (Nunally & Berstein, 1994). As a result of the repeated factor analysis, it was determined that the KMO was .883, Bartlett test of Sphericity was 4476.463, and Cronbach Alpha was .823 for the scale with two sub-dimensions. The item loads for each attitude statement in the scale are presented in Table 3 as determined with the factor analysis.

Table 3. Post-Factor Analysis Varimax Rotated Components Matrix

	Factor 1	Factor 2
16- My teacher does not care about me	,753	
17- My teacher does not help me	,713	
26- My teacher does not like me	,690	
30- My teacher does not support me	,690	
15- I do not like my teacher	,682	
13- My teacher reprimands me	,626	
9- My teacher blames me for everything	,584	
4- My teacher does not award me		,748
6- I cannot talk about my problems with my teacher		,684
5- My teacher acts nervous		,605

One of the operations conducted with SPSS 21.00 was to determine the extent to which the final items in the two-dimensional scale explained the topic. For this purpose, the Total Variance Explained test was conducted and the results are presented in Table 4 below.

Table 4. Total Variance Explained by the Sub-Dimensions

Sub-dimensions	Eigen Values	Total Explained Variance (%)
Factor 1	4,014	33,861
Factor 2	1,088	51,019

As seen in Table 4, it was determined that both dimensions of the "Perceived Middle School Teacher Behavior Scale" explained over 50% of the total variance. This ratio is acceptable in social sciences (Nunally & Bernstein, 1994). Confirmatory factor analysis was conducted to confirm the exploratory factor analysis.
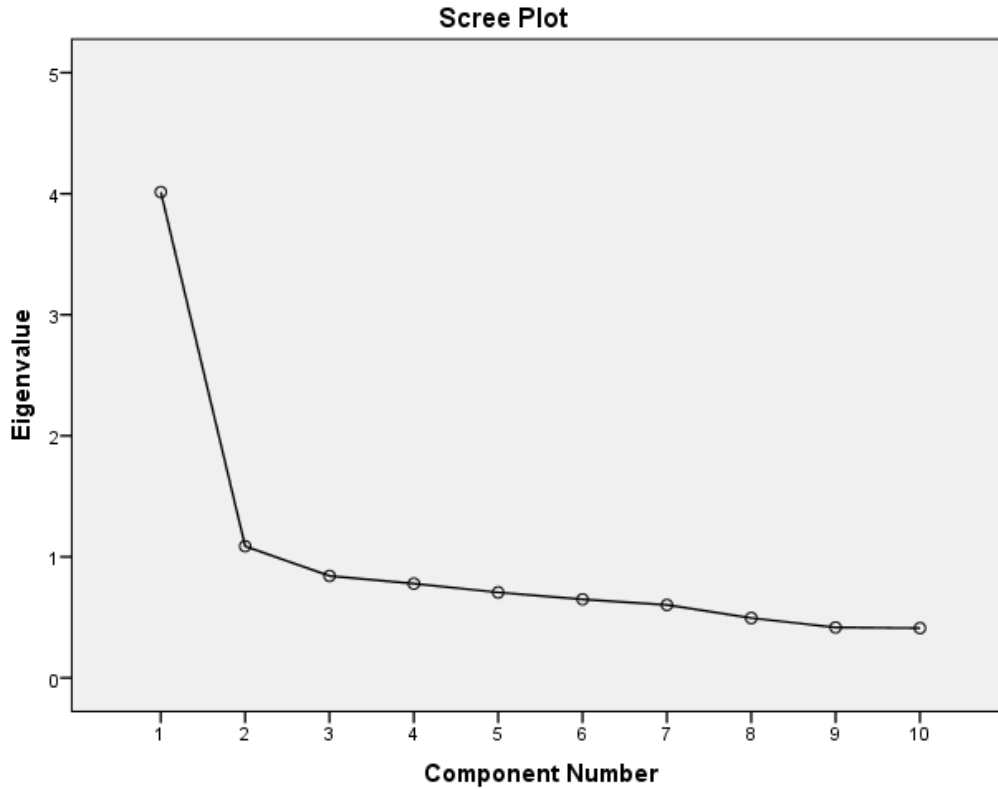
Figure 1. Scree plot

Confirmatory Factor Analysis

For this purpose, Lisrel 8.71 software was used. Confirmatory factor analysis was conducted on the data obtained with the second study group to confirm the 10-item two-factor model obtained in the exploratory factor analysis. For the two-factor model, it was observed that the t values for the explanatory rate of the observed variables by the latent variables were significant at 0.01 level (Çokluk, Şekercioğlu and Büyüköztürk, 2010; Seçer, 2015). In the model, it was observed that the standardized parameter values accurately defined for the observed variables were between 0.77 and 1.08, and the error variances for the observed variables were between 0.44 and 0.87. These values are supported by the studies in the literature (Çokluk, Şekercioğlu, & Büyüköztürk, 2010; Şimşek, 2007; Seçer, 2015). For the model identified in the table 5. below, the goodness of fit values obtained before and after the modifications are presented. As seen in the table, based on the generally accepted criteria, the values obtained for the goodness of fit are depicted as "Excellent, Acceptable or Poor" in the literature (Çokluk, Şekercioğlu, & Büyüköztürk, 2010; Seçer, 2015; Brown, 2006; Şimşek, 2007; Tabachnick & Fidell, 2007).

In confirmatory factor analysis, it was determined that there was a significant difference between expected and observed covariance matrix for two factor model (p <0.05). An insignificant p value is desirable; however, it was considered that this was due to the sample size. Thus, alternative fit

indices were examined. In the first analysis, it was observed that X2 /sd, SRMR (Standardized Root Mean Square Residual), NFI (Normed Fit Index), NNFI (Non-normed Fit Index), CFI (Comparative Fit Index) parameters exhibited excellent fit, and RMSEA (Root Mean Square Error of Approximation), GFI (Goodness-of-fit Index) and AGFI (Adjusted Goodness of Fit Index) parameters exhibited acceptable fit. Due to the answers of students, results were differed from each other. At this stage of the confirmatory factor analysis, modification proposals should be examined in order to improve the model. Based on Lisrel software findings, it was determined that the correlation between the error variances of the "V10 My teacher does not care about me" and "V9 My teacher does not help me" items should be defined.

Table 5. Confirmatory Factor Analysis

paramaters	Excellent (M)	Acceptable (K)	Pre-Modification	Post-Modification
P	> 0.05	< 0.05	0.00 (K)	0.00 (K)
X^2/sd	<3	3-5	77.83/34=2.28 (M)	66.13/33=2.00 (M)
RMSEA	<0.05	<0.08	0.071 (K)	0.063 (K)
RMR	<0.05	<0.08	0.097	0.09 (Zayıf)
SRMR	<0.05	<0.08	0.044 (M)	0.04 (M)
GFI	>0.95	>0.90	0.94 (K)	0.95 (M)
AGFI	>0.95	>0.90	0.91 (K)	0.92 (K)
CFI	>0.95	>0.90	0.97 (M)	0.98 (M)
NFI	>0.95	>0.90	0.96 (M)	0.96 (M)
NNFI	>0.95	>0.90	0.97 (M)	0.98 (M)

After conducting the proposed modifications, the fit index chi-square (X^2) value decreased significantly. The chi-square that could not be analyzed alone was calculated by its ratio to the degree of freedom and reached perfect level (X^2/sd = 2.00). It was also found that the difference between the expected and observed covariance matrix for the model (p <0.05) was also acceptable. It was observed that a fitness index of 0.063, which was at the level of root mean square error of approximation (RMSEA). When the value of RMSEA is less than or equal to 05, the fit is considered perfect, if it is .08 or lower, then the fit is considered acceptable and if the fit is .10 and greater, then it is considered poor. Accordingly, it can be stated that the fitness index obtained in the conducted analysis was acceptable. It was observed that the Standardized Root Mean Residual (SRMR) index was .04. The RMR exhibited poor fit, while a standardized RMR of lower than .05 corresponds to perfect fit, a standardized RMR of lower than .08 corresponds to good fit, and a standardized RMR of lower than .10 corresponds to acceptable fit. Thus, it can be stated that the standardized RMR for the analysis exhibited a perfect fit and the RMR exhibited a poor fit.

It was observed that Goodness of Fit Index (GFI) was .95 and an Adjusted Goodness of Fit Index (AGFI) was .92. GFI and AGFI reflect values that vary between 0 and 1. The fit is excellent when the GFI and AGFI are above .95 and acceptable when these values are between .90 and .94 (Caughlan & Mullen, 2008; Schumacker & Lomax 2004; Hooper,). Thus, it was observed that GFI was close to perfect, whereas AGFI failed to reflect a fit close to an acceptable level.

Analysis of the Non-Normed Fit Index (NNFI), Normed Fit Index (NFI) and Comparative Fit Index (CFI) demonstrated that NNFI was .98, NFI was .96 and CFI was .98. Fit is perfect when the NNFI, NFI and CFI values are above .95, and fit is acceptable when they are above .90 (Sümer, 2000). Thus, it was observed that NNFI, NFI and CFI exhibited perfect fit for the conducted analysis. The resulting path diagram that includes standardized factor loads, error variances and modifications obtained in the confirmatory factor analysis is presented in Figure 2.

Scale Reliability in Time

As a result of the exploratory and confirmatory factor analyses, the correlation coefficient was calculated by conducting a test-retest procedure on score invariance with 200 students attending different grades in middle school to calculate the reliability of the scale in time. The scale was reapplied to the same individuals after three weeks. The Pearson Correlation Coefficient between the scores obtained in these two applications was $r = 0.86$. Based on this result, it was accepted that the scale could be used to conduct reliable measurements (Crocker & Algina, 1985).
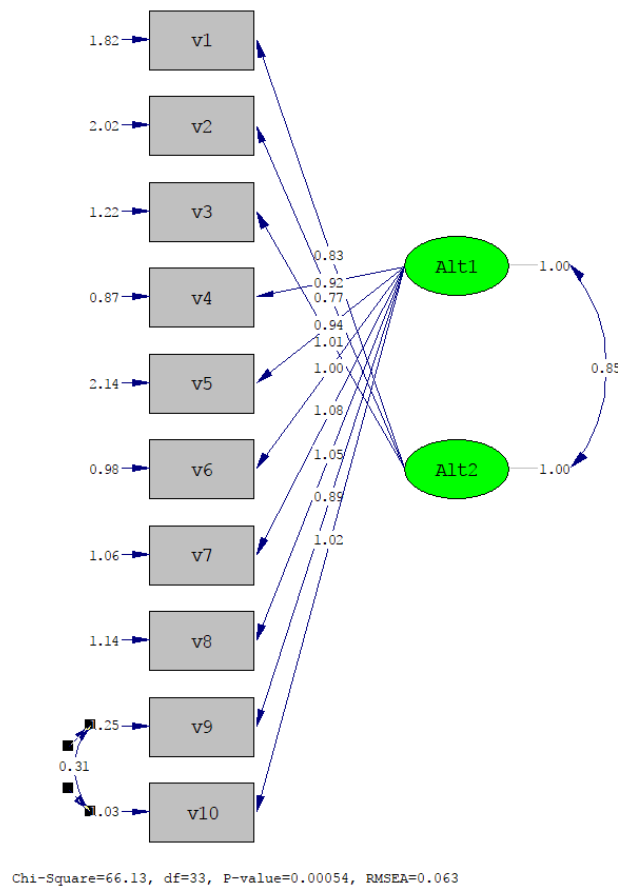

Figure 2- Path diagram for the post-modification two-dimensional model

Conclusion

The study findings demonstrated that the Perceived Middle School Teacher Behavior Scale was confirmed as a two sub-dimensional model and these two dimensions of the scale that was developed to determine the perceptions of middle school students on the behavior of the teachers that instructed their courses were determined as indifferent teacher and authoritarian teacher. Higher scores in the scale reflect higher degree of indifferent and authoritarian behavior. Lower scores in the scale reflect lower authoritarian and indifferent behavior levels exhibited by the teacher. The model was first subjected to exploratory factor analysis and then to confirmatory factor analysis. It was concluded that the item pool and expert views in the exploratory factor analysis, Cronbach Alpha reliability coefficient in the factor analysis conducted after the pilot scheme, KMO and Bartlett Test of Sphericity findings for each sub-dimension, and the total explanatory variance values for the subscales of the final scale were acceptable. Furthermore, the model of fit indexes for the developed model was confirmed as a result of the Confirmatory Factor Analysis. In addition, it was determined that all standardized parameters were at acceptable or excellent levels, and thus all constructs exhibited associative validity (Chou, Boldy, & Lee, 2002). The study results confirmed that the scale was a valid and reliable scale.

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Appendix 1- Perceived Instructor Behavior Scale

Instructions: Below you will find certain statements that aim to determine perceived instructor behavior. Please mark the corresponding answer that is closest to your view with an X. The objective of the present study is purely scientific. We thank you in advance for your sincere and full responses.

	I agree	I somewhat agree	I neither agree nor disagree	I disagree	I completely disagree
1- My teacher does not award me					
2- I cannot talk about my problems with my teacher					
3- My teacher acts nervous					
4- My teacher blames me for everything					
5- I do not like my teacher					
6- My teacher reprimands me					
7- My teacher does not support me					
8- My teacher does not like me					
9- My teacher does not help me					
10- My teacher does not care for me					