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Research Article

Adaptation of Self-Control and Self-Management Scale (SCMS) into Turkish Culture: A Study on Reliability and Validity

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Abstract

The aim of this study is to adapt self-control and self-management scale (SCMS) developed by Mezo into Turkish and to test it considering gender and academic achievement variables. The scale was translated from English to Turkish for linguistic validity and then this scale was translated into English using back translation. The original and translated English version of the form was revised and edited by considering the opinions of three language experts of English. Considering the appropriateness of the scale into Turkish, the draft of the scale was evaluated by two Turkish language experts and two academicians from the Education Faculty evaluated the scale in terms of content. Necessary corrections were made and linguistic equivalence was obtained. In order to test the reliability of the scale, the original scale and a week later the Turkish form were implemented with 127 4th year students studying in English Language Teaching Department. Regarding the findings about linguistic equivalence, the correlation coefficients of self-control and self-management scale (SCMS) in both Turkish and English versions were found to be r_{SCMS} = .91, r_{SR} = .81, r_{SE} = .79 and r_{SM} = .84 Moreover, the Turkish scale was applied on the second sampling of the study which consisted of 159 students for the second time after a week via test-retest method. The reliability coefficients found revealed that the scale was reliable. The construct validity was carried out via exploratory factor analysis (EFA) with the intention of evaluating the structure of the draft scale in Turkish culture and 1006 students composed the third sampling of the study for validity. Moreover, confirmatory factor analysis (CFA) was administered. The total variance explained by the scale with three factor structure is 54.09%. In the second level of confirmatory factor analysis, it can be stated that the three-dimensional model has a good fit (RMSEA = .052, NFI = .97, CFI = .98, GFI = .96, AGFI = .94, RFI = .97). All these findings revealed that the scale was satisfactory considering reliability and validity (KMO = .91, Bartlett's test X^2 = 5119.371). In terms of gender variable, a significant difference was found in favor of female pre-service teachers in the entire scale and in all its sub-scales. Moreover, it was found that there was a positive and meaningful relation between the scores earned from the scale in general and from its sub-scales and pre-service teachers' academic achievement scores.

Keywords

Self-control • Self-management • Scale • Adaptation of a scale • Validity • Reliability

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According to management science, employees control themselves when they are involved in an organization and this phenomenon is called "self-management" (Manz & Sims, 1980). At first, self-management was based on the concept of self-control developed in clinical psychology (Cautela, 1969 as cited in Neck & Houghton, 2006). In brief, self-management consists of strategies designed to help an individual to manage his behaviors related to reduction of the inconsistencies with the externally determined standards. Self-control and self-management skills developed by Kanfer (1970) and Bandura (1991) are a three-component model consisting of three processes interconnected to one another: "Self-monitoring" (SM), "Self-Evaluating" (SE), and "Self-Reinforcing" (SR). In SM stage, the individual monitors some behavior targeted for change or maintenance (such as actions, thoughts or emotions) and draws attention to informative stimuli. In the stage of SE, the individual compares the target behavior and internalized standard. He passes judgment on whether the monitored stimuli progresses towards valuable targets or not. Finally, in the light of this comparison, the individual engages in SR which can be either open or secret and involves self-rewarding or self-punishment. In other words, this includes the implementation or lack of reward (Mezo, 2009; Mezo & Short, 2012). Then, the results of the self-control and self-management skills has an effect on whether the feedback loop will be repeated or not, changed or not, or used or not. A shy woman who wants to meet people can be given as an example to this recursive feedback loop. Despite her shyness, the woman tries to realize that a new social interaction is quite harmless (SM), her performance in this social situation is not bad (SE) and that is why she admires herself for her social behavior (SR) thanks to emotions for new social interactions and encouraging thoughts experienced in the future. This person certainly cannot cope with her shyness for the first time, but her capacity increases with each recursive loop in order to meet a new person, namely, with recursive implementation of self-control and self-management skills, she becomes less shy. Therefore, the individual can exert control on low probability target behavior which will occur in future by evaluation of stimuli associated with that behavior and repeatedly reinforcing effective monitoring (Mezo, 2009).

In literature, self-management is collected under three different titles. The first one is self-leadership in the field of industry/organizational psychology, the second one is self-regulation in health psychology, and the last one is studied as "mindfulness" especially in clinical psychology (Yaka, 2011). This study mostly lays emphasis on the self-management based on self-leadership in the field of industry/organizational psychology because human beings must be able to lead themselves first and then they must share this process with others (Houghton, Neck, & Manz, 2003; Manz, 1992).

Self-management can be regarded as a cluster of strategies that help employees structure the work environment while generating self-motivation. Self-leadership involves self-management behavior (Neck & Houghton, 2006); however, there is

central difference between them. Self-management is associated with a series of behavioral and cognitive strategies which people are required to perform and reflect rational appearance. Self-leadership goes beyond this to put an important emphasis on the internal value of the tasks and self-management depends on external control. The differences between self-management and external control can be uncertain according to the viewpoint adopted. Self-management emphasizes rewards that are received when completing a task and that are separate from the task like praising oneself, external recognition, and reward. In short, self-management consists of a series of strategies that facilitate behaviors that serve to reduce deviations from the existing standards so that an individual can manage his own behaviors (Manz, 1986). While an individual's sudden behavior is defined as self-control, the main purpose of the overall process is directed towards serving the requirements of externally determined standards. Self-management strategies express short-term deviations from the standards, but not convenience or attraction of management standards (Godwin, Neck, & Houghton, 1999). Self-management has been conceptualized as the ability to maintain a low probability behavior without external support (Kanfer, 1970). Self-management is described as a process in which an individual prefers the less attractive one (Neck & Houghton, 2006). Self-leadership merges the behavioral strategies suggested by self-management and self-control with cognitive strategies based on the concepts of constructive thought patterns and intrinsic motivation (Manz, 1986). Self-leadership theory focuses on the reasons for the behavior and merges the behavioral and cognitive strategies but when compared to self-management, fundamentally it expresses self-efficacy (Neck & Houghton, 2006). While self-management emphasizes extrinsic rewards, self-leadership goes beyond this perspective to focus on natural rewards that result from the performance of the task or activity (Manz, 1986).

Considering education, self-management strategies are alternative strategies which increase appropriate behaviors in the school, reduce inappropriate behaviors, enable students to generalize their learned behaviors, and enhance academic performance (Todd, Horner, & Sugai, 1999). Moreover, as self-management is learned, there is an opportunity to enhance individual performance with self-management training (Frayne & Geringer, 2000). Thus, one of the purposes of this research study is to test whether self-management strategies promote academic achievement or not with this adapted scale. When a person learns how to manage both extrinsic and intrinsic conditions, this person can exercise self-control (Mahoney & Thoresen, 1972). Despite the findings which reveal that self-management strategies are in favor of females (Uğurluoğlu, 2010) and males (Covarrubias & Stone, 2015) considering gender, there are findings which reveal that there is not a significant difference between them (Carmeli, Meitar, & Weisberg, 2006; Kazan, 1999; Kurman, 2001; Razieh, Reza, & Saeid, 2013; Türköz, 2010). Therefore, the desire to test the self-management strategies in terms of gender with this adapted scale is another purpose of the study.

The definitions of self-control and self-management skills have been developed nearly for 30 years and they have been corrected by different research programs and they promise hope with more practical and theoretical contributions (Mezo, 2009). However, Mezo (2009) considers that none of the tools developed have been clearly designed to evaluate the full content validity of self-control skills and they are not able to integrate the latest developments within the structure of self-control and self-management skills and emphasizing that an up-to-date content must be created and Mezo designed self-control and self-management scale (SCMS) to evaluate self-management structure and construct validity (Mezo & Short, 2012). Because of these reasons, this scale was adapted by the researcher to measure individuals' self-control -self-management skills with self-control and self-management scale (SCMS) and to make contributions to this field with quantitative data with the research studies based on this scale and to pioneer the similar studies which will be carried out later. Moreover, it was found that an evaluation tool was not developed to measure self-control and self-management skills in national literature and it is anticipated that this study will fill an important gap as a measuring instrument with its reliability and validity for the researchers to measure the general features of the adults' self-control and self-management skills.

In summary, the purpose of this study is to adapt the self-control and self-management scale (SCMS) developed by Mezo (2009) into Turkish and to test this adapted scale on a population in terms of gender and academic achievement.

Method

The Population and the Sample

The population of the research study is composed of total 7460 students studying in the undergraduate programs of an education faculty in a state university. While selecting the samples, stratified purposeful sampling, one of the non-probability sampling methods, was utilized in the study. Undergraduate programs and class levels were considered in stratification. The researcher carried out an implementation to determine the construct validity of the scale in May, 2014 and total 1006 undergraduate students studying in total 14 teaching programs participated in the implementation. Out of 1006 participants, 643 of them were females (64.1%) and 363 of them were males (35.9%). 144 participants (14.3%) were first year students, 221 students (22.0 %) were in their second year, 324 participants (32.2%) were third year students and there were 269 participants (26.7%) in their fourth year and 48 students (4.8%) in their fifth year at the university. When the distribution of participants considering their departments were examined, there were 145 students (14.4%) studying in Primary School Mathematics Education, 55 participants (5.5%) in Pre-school

Teaching, 204 students (20.3%) in Primary School Teaching, 81 students(8.1%) in Social Sciences Teaching, 123 students (12.2%) in Science Teaching, 53 participants (5.3%) in Secondary School Mathematics Education, 30 participants (3.0%) in History Teaching, 89 students (8.8%) in Philosophy Teaching, 31 participants (3.1%) in Chemistry Teaching, 21 participants (2.1%) in Physics Teaching, 38 participants (3.8%) in Biology Teaching, 39 participants (3.9%) in Geography Teaching, 50 participants in (5.0%) in Psychological Counselling and Guidance Teaching, and 47 students (4.7%) in Computer and Instructional Technologies Teaching.

The Measuring Instrument

SCMS is a self-evaluating tool for adults which has been developed for measuring the overall features of self-control and self-management skills, has a cognitive and behavioral structure, and which has been successfully evaluated during the development process of the scale (Mezo, 2009). SCMS is a process-driven scale evaluating each one of the three components of self-management independently (Mezo & Short, 2012; Xue & Sun, 2011).This scale was submitted to 302 undergraduate students by Mezo (2009) and he used exploratory factor analysis (EFA) to uncover the factor structure of the scale and he determined that the scale consisted of three sub-dimensions including "Self-Reinforcing" (SR), "Self-Evaluating" (SE) and "Self-Monitoring" (SM). The factor loadings of five items in the sub-dimension of SR range between 53-.73; the factor loadings of five items in the sub-dimension of SE range between .56-.67; and the factor loadings of six items in the sub-dimension of SM range between .44-.66. When the correlation coefficients between the scale's sub-dimensions and the entire scale was considered, the correlation value found was .73 between the sub-dimension of SR and the entire scale, .70 between the sub-dimension of SE and the entire scale, and .77 between the sub-dimension of SM and the entire scale. The reliability of the scale was determined via test-re-test method with 212 undergraduate students and as a result of this, the following values were obtained: .75 for the entire scale, .70 for the sub-dimension of SR, .62 for the sub-dimension of SE, and .66 for the sub-dimension of SM. The SCMS contains 16 items assessed on a six-point Likert scale (0-5) and the total point one can get from the scale changes between 0 and 80 (Mezo, 2009; Mezo & Heiby, 2011).

Procedure

Necessary permissions were obtained contacting with the researcher who developed the scale via e-mail for the adaptation of the scale (SCMS) to Turkish. The scale has been translated into Turkish and linguistic validity, construct validity, and the reliability of the scale have been done. The scale's reliability and validity analysis were done with a computer programme. The adaptation of the scale to Turkish was done in line with Hambleton and Patsula's (1999) suggestions related to principles of cross-cultural adaptation of a scale:

a) The original scale was translated into Turkish by two experts who are fluent in both languages and opinions were taken for the significant differences between the translations of two experts and the translation process was completed. Then, the scale draft translated into Turkish was translated into English and the consistencies between the original items and the adapted version were examined. The examination revealed that there was a linguistic equivalence between the items in the original scale and the items in the translated version.

b) The semantic (the meaning of the words), idiomatic (the meaning of the idioms used in daily life), experiential (the existence and meaning of the experiences), and conceptual (using the concepts in the same context) equivalence of the items in the scale were considered and for that purpose the opinions of two experts from the field were taken.

c) The scale was piloted with the students from education faculty with the intention of evaluating construct validity for the scale's factor structure and the reliability of the scale points. According to the data obtained, the factor structures for the translated Turkish version was analyzed considering the sub-dimensions of the scale.

Factor analysis is used to reduce the number of variables by identifying basic variables or factors among observed, correlated variables. Each identified factor consists of a set of variables in a dataset which measure the same feature as a result of the measurement of the correlation between the variables. In other words, factor analysis is used to discover factors. While obtaining factors, factor analysis examines correlations among the observed variables by calculating correlation coefficients to determine the extent of covariance among variables considering the participants' responses to a subject (Ural & Kılıç, 2011). To determine the psychometric features of the scale, the latest version of the scale was applied to the study group and exploratory and confirmatory factor analyses were done to uncover the implicit structure of the scale and to verify the original structure of the scale. First, EFA was performed to reveal the factor structure of the scale. EFA aims to explore the factor structure based on the correlations between the variables (Kline, 1994; Tabachnick & Fidell, 2013). While selecting the items to be included in the scale in EFA, it is considered that the eigenvalues of the items must be at least 1 (Büyüköztürk, 2010; Can 2013; Kalaycı, 2006; Shevlin & Lewis, 1999), items' factor loading values must be at least .30 (Büyüköztürk, 2010; Martin & Newel, 2004; Schriesheim & Eisenbach, 1995), and the items must be included in only one factor and there must be at least a difference of .10 between the factors included in two factors (Bayram, 2004; Büyüköztürk, 2010; Tavşancıl, 2006).

Because CFA is a statistical technique frequently used to test whether measurement instruments are consistent with data, CFA has been performed to verify the factor structure of the scale determined by EFA (Graham, Guthrie, & Thompson, 2003). CFA

which examines the consistency between the model and data allows the researcher to test the hypothesis that a relationship between the variables exists (Kline, 1994; Tabachnick & Fidell, 2013). As in this study, the researcher who conducts a cross-cultural study can use CAF to compare the equivalence of factor structures across different cultures (Watkins, 1989). The most frequently used fit indices to evaluate the reliability of the model in CFA are Chi-Square Value of Goodness of Fit Test (X^2), Goodness of Fit Test (GFI), Adjusted Goodness of Fit Test (AGFT), Root Mean Square Error (RMR or RMS) and Root Mean Square Error of Approximation (RMSEA) (Schumacker & Lomax 2010; Meyers, Gamst, & Guarino 2006). It is determined that out of these goodness of Fit indices, a value greater than .90 for GFI, AGFI, NFI, RFI, CFI and IFI indices and a value less than .08 for RMSEA are considered good fit (Hair, Black, Babin, & Anderson, 2009; Hu & Bentler, 1999; Kline, 2011; Schumacker & Lomax, 2010; Şimşek, 2007; Tabachnick & Fidell, 2013). For the adjusted model fit to data, the values greater than .90 for GFI and AGFI and the values smaller than .05 for RMR or standardized RMR and RMSEAa re considered good fit but there is adequate fit if RMR or standardized RMR and RMSEA is less than 0.8 (Çokluk, Şekercioğlu, & Büyüköztürk, 2012; Şimşek, 2007). If X^2/df ratio calculated by CFA is smaller than 5, it indicates that there is a moderate fit of the model to real data (Sümer, 2000; Şimşek, 2007). In CFA, the sample size is calculated for each parameter by multiplying by 10. It can be stated that regarding the collected data for this research study, the number of participants (n = 1006) supplied the desired quantity (16x10 = 160) at an extremely high level. Moreover, LISREL and SPSS package program were used for the operations performed on the data.

Findings

The validity for the scale's original factor structure in Turkish culture for the three sub-dimensions in the scale was firstly performed by EFA and in this first analysis, the measurement instrument met the criteria mentioned above for the model-data adjustment. CFA was performed to examine the consistency of the measurement models which identified the factor structure determined with this analysis with the data and the results of both analyses were presented below.

Linguistic Validity

In the studies of scale adaptation, it is important that the statements must be compatible with the language and culture to which they will be adapted. Moreover, for a scale to be used in other culture, this scale must be fit to the culture in which it will be used, its psychometric features (reliability and validity) must be adequate and compatible with the psychological features in the new culture (Deniz, 2007). For that reason, the study for the scale's linguistic equivalence was applied on 127

4th year students studying in English Language Teaching department by adopting bilingual group design (first the original scale and a week later the Turkish form of the scale). The translation of the scale into Turkish was done in two stages. Because it is suggested that at least two forward translations should be made of the scale from the original language (source language) to the target language for comparison (Beaton, Bombardier, Guillemin, & Ferraz, 2000), two translators who are fluent in both languages translated the scale into Turkish independently. Then, these translations were compared by the researcher and a translator and the best translations for the items were adopted. After that, two faculty members reached a consensus for the final version of the scale's Turkish form. Moreover, the translated questionnaire items were given to the experts from the field working with university students and their opinions on the appropriateness and comprehensibility of the expressions were taken. Three bilingual translators translated the translated version back into the original language (English). The English version of the scale obtained as a result of this second translation (back translation) and the items in the original version of the scale were given to the three experts of English to analyze them in terms of grammar, structure, and unity in meaning. The back translation and the items in the original source version were analyzed by the three experts in English independently in terms of grammar, structure, and unity in meaning and the necessary corrections were made. These experts' opinions were taken about the consistency of the two scales with each other. After they agreed that both forms were quite similar to each other, the form was evaluated in terms of content by the faculty members working in education field and then the first translated version of the form was examined by the two experts of Turkish language in terms of compatibility to Turkish. Considering the opinions received, corrections were made and the scale was finalized with regard to linguistic equivalence. As a result of the correlation analysis, the correlation between the source and target (Turkish) versions of the scale was presented in Table 1.

Table 1
Findings of Self-Control-Self-Management Scale's Linguistic Equivalence

Factors	Implementation	$\overline{X}$	*s*	*r*
Self-Reinforcing (SR)	English Questionnaire	3.7654	.8095	.81*
	Turkish Questionnaire	3.7858	.8083	
Self-Evaluating (SE)	English Questionnaire	3.7921	.9789	.79*
	Turkish Questionnaire	4.0063	.9046	
Self-Monitoring (SM)	English Questionnaire	3.6640	.7261	.84*
	Turkish Questionnaire	3.6916	.7786	
Self-Control and Self-Management Scale (SCMS)	English Questionnaire	3.7357	.5756	.91*
	Turkish Questionnaire	3.8194	.6382	

*$p < .001$.

When Table 1 is examined, it is found that there is a significant positive relationship for the sub-dimensions of "self-reinforcing" (r = .81), "self-evaluating" (r = .79), "self-

monitoring" (r = .84) and for "the whole scale" (r = .91). As a result of the processes and analyses, it can be stated that both Turkish and English version of the scale are equivalent. Because of the significant positive relationship, it is accepted that the Turkish version of the scale is satisfactory enough to represent the original source version (English) of the scale and construct validity is considered as the next stage.

Construct Validity

First of all, the data's compatibility to factor analysis was tested in order to determine the compatibility of factor structure of the adapted version of the scale and the original version of the scale. In factor analysis, Kaiser-Meyer-Olkin (KMO) test was used to determine the data sufficiency obtained from the sampling (Tavşancıl, 2006). Tabachnick and Fidell (2013) and Comrey and Lee (1992) stated that 300 people would be enough for factor analysis. In this study, as a result of the analysis of data collected from 1006 students, KMO value of .91 and Bartlett's test was found to be meaningful with X^2 value of 5119.371 ($p < .001$). If a KMO value is between .5 and.7, it is considered as normal, a KMO value of .7and.8 is considered as good, a value between .8 and.9 is considered very good and a value above 9 is considered to be perfect (Hutcheson & Sofroniou, 1999). In other words, if a KMO value is less than .5, it is considered inadequate (Leech, Barrett, & Morgan, 2005), but if a KMO value is greater than .6' and the Bartlett's test is meaningful, it reveals that the data are appropriate for factor analysis (Büyüköztürk, 2010; Kalaycı, 2006). The factor design of the scale was presented in Table 2.

Table 2
Factor Design of Self-Control- Self-Management Scale

Items	Self-Reinforcing (Factor 1)	Self-Evaluating (Factor 2)	Self-Monitoring (Factor 3)	Common Factor Variance (h^2)
M12	**.767**	.246	.153	.673
M16	**.760**	.215	.125	.639
M15	**.757**	.277	.201	.690
M14	**.752**	.074	.085	.578
M13	**.545**	-.135	.228	.367
M10	.177	**.691**	.164	.535
M9	.305	**.689**	.142	.587
M11	.011	**.668**	.174	.476
M7	.144	**.656**	.219	.499
M8	.016	**.604**	.052	.368
M1	.199	.219	**.684**	.555
M2	-.104	-.065	**.683**	.481
M5	.313	.284	**.617**	.559
M3	.331	.346	**.612**	.604
M4	.371	.247	**.594**	.551
M6	.259	.292	**.581**	.491
%54.09	%20.06	%17.49	%16,54	

According to Table 2, the scale has a three-factor structure. The first factor (self-reinforcing) explains 20.06% of the total variance of the scale, the second one (self-evaluating) explains 17.49% of the total variance, and the third factor (self-monitoring) explains 16.54% of the total variance. The three-factor structure explains 54.09% of the total variance. After the factor rotation, it is regarded that the first (12, 16, 15, 14, 13) and the second (10, 9, 11, 7, 8) factors of the scale consist of 5 items and the third factor has 6 items (1, 2, 5, 3, 4, 6). It is approximately found that the loading value in the 1st factor is .55-.77, the factor loadings of the 2nd factor is .60-.69 and the factor loading values of the 3rd factor is .58-.68. It is required that the factor loading value must be higher than .45 However, when there are few items for implementation, this value can be reduced to .30 (Büyüköztürk, 2010). The data obtained fulfil the condition of being .45 or higher than .45.

In multi-factor designs, it is important that common factor variance should be calculated. Common factor variance is expressed as the sum of the squared factor loadings for a given variable and it describes the common variance of factors shared among the original variables as a result of factor analysis (Çokluk et al., 2012; Köklü, 2002). If common factor variance is less than .20, it is required that this item should be extracted from the measuring instrument and analyzed again (Şencan, 2005). In Table 2, the values for rotated component matrices were given, the items grouped into the same factor were highlighted in bold type and moreover, the sum of squared factor loadings was presented. It is viewed that the common factor variances of 16 items in the scale approximately ranged between .37 and .69 and common factor variance (h^2) for each item was greater than .20.

When the items grouped into the same factor were analyzed, it was revealed that the items grouped together were the same as the sub-dimensions determined by Mezo (2009). The items in the first factor were grouped into the "self-reinforcing" sub-dimension, the items in the second factor were grouped into the "self-evaluating" sub-dimension, and the items in the third factor were grouped into the "self-monitoring" sub-dimension.

Confirmatory Factor Analysis (CFA)

The fit indices of Chi-Square Value of Goodness of Fit Test (X^2), Goodness of Fit Test (GFI), Adjusted Goodness of Fit Test (AGFI), Comparative Fit Index (CFI), Relative Fit Index (RFI) Normed Fit Index (NFI), Incremental Fit Index (IFI) and Root Mean Square Error of Approximation (RMSEA) determined in CFA done with LISREL computer program were used in order to reveal the validity of the factor structure of the scale and sufficiency of the model identified by EFA. According to Şimşek (2007), it is determined that the value .90 is considered adequate for GFI, CFI, NFI, RFI and IFI indices, the value of .95 is considered perfect fit. For RMSEA, .08 is considered acceptable fit value and .05 is considered perfect fit. CFA analyzed

the fit indices of the Turkish version of the scale's three dimensional model and the relevant data were presented in Table 3 and Figure 1.

Table 3
Results of CFA Fit Indices DFA

X^2	df	RMSEA	RMR	GFI	AGFI	NFI	NNFI	CFI	IFI	RFI
388.43	101	.053	.04	.96	.94	.97	.97	.98	.98	.96

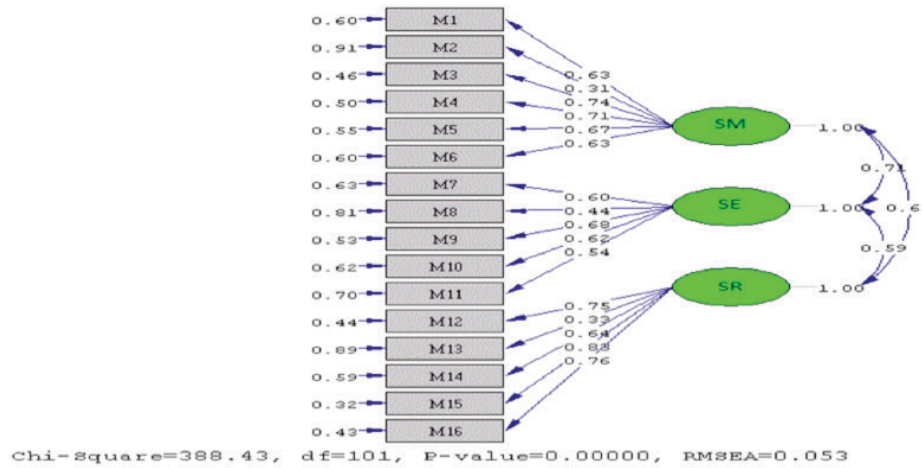


Figure 1. Results of Factor Analysis (CFA) for Self-Control –Self-Management Scale.

According to Table 3 and Figure 1, it can be stated that the fit indices and minimum Chi-square value ($X^2 = 388.43$, df = 101, $p = .00$, $X^2/df = 3.85$) is meaningful in CFA which is performed to examine to what extent the scale consisting of 16 items and 3 factors are consistent with the collected data. In large samples, if the ratio of X^2/df is below 3, it is considered perfect fit, and if it is below 5, it is considered moderate fit (Çokluk et al., 2012; Şimşek 2007). Therefore, it is viewed that the value of X^2/df implies moderate fit. The fit index values were as follows: RMSEA = .053, RMR = .04, GFI = .96, AGFI = .94, NFI =.97, NNFI = .97, CFI = .98, IFI = .98 and RFI = .96. It can be stated that all of the fit indices of this structural model shows a good fit.

Meydan and Şeşen (2011) assert that while applying CFA, second level of multi-factor models of multi-dimensional scales must certainly be tested. The second order of CFA can be described as a model in which the observed variables were gathered under a more than one and independent factor and these factors unite with a much broader and inclusive factor. The model is based on the principle that the observed variables are grouped under more than one independent dimension and then these factors are gathered up under a much more inclusive model (Meydan & Şeşen, 2011; Seçer, 2013; Şimşek, 2007). The second order CFA results related to the three-factor model of Self-Control Self-Management Scale were presented in Table 4 and Figure 2.

Table 4
Fit Index Results for the Second Order CFA

X^2	df	RMSEA	RMR	GFI	AGFI	NFI	NNFI	CFI	IFI	RFI
374.69	101	.052	.082	.96	.94	.97	.98	.98	.98	.97

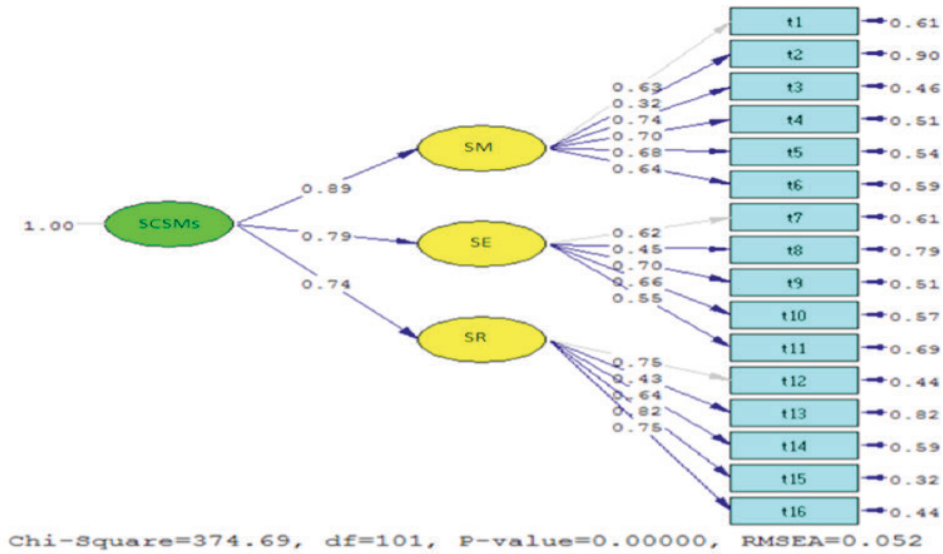


Figure 2. Results of Second Order Confirmatory Factor Analysis (CFA) for Self-Control-Self-Management Scale.

When Table 4 and Figure 2 are examined, it is viewed that the model fit (X^2 = 374.69, df = 101, p = .00, X^2/df = 3.71) of second order CFA for Self-Control-Self-Management Scale consisting of 16 items and three factors and the model fit indices are considered good (RMSEA = .052, RMR = .082, NFI = .97, CFI = .98, IFI = .98, RFI = .97, AGFI = .94, GFI = .96, NNFI = .98).

Reliability

The Turkish version of the scale was examined with internal consistency and test-retest methods. Considering the data obtained from 1006 students studying in Education faculty, Cronbach alpha's internal consistency values calculated to determine the internal consistency of the scale were found .87 for the "entire scale," .81 for "Self-Reinforcing" sub-dimension, 0.73 for "Self-Evaluating" and .80 for "Self-Monitoring" sub-dimension. Test-retest process was administered twice with the 159 students studying in primary school teaching department of the same faculty, with the second administration coming a week after and the reliability coefficients were presented in Table 5.

Table 5
Test-Retest Reliability Coefficients of Self-Control-Self-Management(SCMS) Scale

	Administration	$\overline{X}$	*s*	*r*
Self-Monitoring (SM)	1st administration	3.6614	.7872	.82*
	2nd administration	3.6436	.8094	
Self-Evaluating (SE)	1st administration	3.8453	.9129	.73*
	2nd administration	3.8277	.9537	
Self-Reinforcing (SR)	1st administration	3.7560	.9282	.74*
	2nd administration	3.7296	1.0146	
Self-Control and Self-Management Scale (SCMS)	1st administration	3.7484	.6975	.92*
	2nd administration	3.7280	.7343	

*$p < .001$.

According to Table 5, because reliability coefficient is r = .92 for "the entire scale", r = .82 for "Self-Reinforcing" sub-dimension, .73 for "Self-Evaluating" and .74 for "Self-Monitoring" sub-dimension, it can be stated that test-retest reliability coefficient is adequate. In order to determine whether a scale does not change towards time, the correlation coefficient is sought to be positive and high and this value should be also at least .70 for the scales (Tavşancıl, 2006). Pearson correlation analysis was performed to reveal the relationship between the factors of the scale and these findings were presented in Table 6:

Table 6
Correlation Coefficients between the Factors of Self-Control-Self-Management (SCMS) Scale

	Self-Reinforcing	Self-Evaluating	Self-Monitoring
Self-Reinforcing (SR)			
Self-Evaluating (SE)	.409**		
Self-Monitoring (SM)	.525**	.512**	
Self-Control and Self-Management Scale (SCMS)	.799**	.785**	.843**

**$p < .001$.

According to Table 6, the sub-dimensions of the scale have a meaningful and positive relationship among themselves and there is a meaningful and positive relationship between the scale and its sub-dimensions.

Item Analysis Based on Upper/Lower Group Mean Scores

Total mean scores which 1006 participants in the study group got from the scale were sorted from the lowest to the highest to determine the distinctiveness of each item in the scale and total mean scores of 544 participants, consisting of upper 27% and lower 27% of the total group, were compared to *t*-test for the entire scale, dimensions and each item. The results were presented in Table 7.

Table 7
t-Test Results Based on Upper/Lower 27% of Group Mean Scores for Self-Control-Self-Management (SCMS) Scale and Its Sub-Dimensions

	Groups	$\overline{X}$	*s*	*t*-test
Self-Monitoring (SM)	Lower group	2.5895	.98709	-26.71*
	Upper group	4.3290	.42387	
Self-Evaluating (SE)	Lower group	2.5941	1.13617	-25.58*
	Upper group	4.4985	.46580	
Self-Reinforcing (SR)	Lower group	2.2654	1.07833	-28.81*
	Upper group	4.3647	.53089	
Self-Control and Self-Management Scale (SCMS)	Lower group	2.4897	.72261	-41.29*
	Upper group	4.3932	.23649	

*$p < .001$.

According to Table 7, it is viewed that there is a significant difference at the level of $p < .001$ between the total mean scores of the lower and upper 27% group total mean scores in 3 sub-dimensions and the entire scale. Item analysis results based on lower and upper 27% of groups were given in Table 8.

Table 8
Item Analysis Results Based on Mean Scores of Lower and Upper 27% of Groups

Item	Groups	$\overline{X}$	*s*	*t*-Test	Item	Groups	$\overline{X}$	*s*	*t*-Test
M1	Lower group	2.57	1.573	-16.64*	M9	Lower group	2.72	1.866	-17.86*
	Upper group	4.44	.997			Upper group	4.85	.618	
M2	Lower group	2.41	1.419	-9.88*	M10	Lower group	2.80	1.848	-16.10*
	Upper group	3.57	1.332			Upper group	4.75	.765	
M3	Lower group	2.94	1.670	-17.45*	M11	Lower group	2.47	1.565	-16.31*
	Upper group	4.77	.437			Upper group	4.33	1.031	
M4	Lower group	2.48	1.424	-19.49*	M12	Lower group	2.35	1.626	-20.00*
	Upper group	4.39	.760			Upper group	4.54	.782	
M5	Lower group	2.58	1.473	-18.67*	M13	Lower group	2.07	1.465	-16.23*
	Upper group	4.48	.792			Upper group	3.90	1.141	
M6	Lower group	2.55	1.408	-18.03*	M14	Lower group	2.23	1.527	-17.05*
	Upper group	4.32	.789			Upper group	4.17	1.094	
M7	Lower group	2.66	1.713	-15.30*	M15	Lower group	2.47	1.666	-21.03*
	Upper group	4.49	.979			Upper group	4.72	.574	
M8	Lower group	2.32	1.640	-13.02*	M16	Lower group	2.21	1.578	-21.06*
	Upper group	4.08	1.504			Upper group	4.50	.859	

*$p < .001$.

According to Table 8, a significant difference at the level of $p < .001$ was found between the total mean scores for all items as a result of the item analysis performed for lower and upper 27% groups.

This adapted scale was tested on the sampling consisting of 979 pre-service teachers in a study carried out in 2015. *t*-test was used for independent groups to determine whether there was a difference between the mean scores of two groups of participants in terms of gender variable and the results were presented in Table 9.

Table 9
t Test Results for Independent Groups Related to the Scores of Two Groups from Self-Control-Self-Management (SCMS) Scale Considering Gender Variable

	Gender	*n*	$\overline{X}$	*s*	*t*	*p*
Self-Monitoring (SM)	Female	626	3.5935	.92131	2.046	.041*
	Male	353	3.4674	.93235		
Self-Evaluating (SE)	Female	626	3.7323	1.04332	2.515	.012*
	Male	353	3.5552	1.08226		
Self-Reinforcing (SR)	Female	626	3.5412	1.05927	3.911	.000*
	Male	353	3.2584	1.13373		
Self-Control and Self-Management Scale (SCMS)	Female	626	3.6205	.81060	3.486	.001*
	Male	353	3.4295	.84461		

*$p < .05$, df: 977.

When Table 9 is examined considering gender variable, it is found that there was a meaningful difference at the significance level of $p < .05$ in favor of female pre-service teachers in the sub-dimensions of "Self-Monitoring" ($\overline{X} = 3.5935$; $t = 2.046$), "Self-Evaluating" ($\overline{X} = 3.7323$; $t = 2.515$), and "Self-Reinforcing" ($\overline{X} = 3.5412$; $t = 3.911$) and in the entire "Self-Control-Self-Management Scale" ($\overline{X} = 3.6205$; $t = 3.486$). Moreover, Pearson correlation analysis was performed to determine whether there was a relationship between the scores students got from this scale and academic achievement scores they got from the faculty and the results were presented in Table 10.

Table 10
Pearson Correlation Analysis Results Showing the Relationship Between the Scores Students Got from the Scale and the Academic Achievement Score

	n	*r*	*p*
Self-Monitoring (SM)	898	.178	.000**
Self-Evaluating (SE)	898	.182	.000**
Self-Reinforcing (SR)	898	.147	.000**
Self-Control and Self-Management Scale (SCMS)	898	.209	.000**

**$p < .01$.

When Table 10 is analyzed, it draws attention that there is a positive and meaningful relationship between the scores students got from the sub-dimensions of "Self-Monitoring" (r = .178), "Self-Evaluating" (r = .182), and "Self-Reinforcing" (r = .147) and from the entire "Self-Control-Self-Management Scale" (r = .209) and pre-service teachers' academic achievement scores.

Discussion and Conclusion

The purpose of this study was to adapt self-control-self-management scale developed by Mezo (2009) to Turkish and to examine the psychometric features of the scale on a sampling consisting of Turkish students studying at a state university and also to test the scale in terms of gender and academic achievement variables. After the expert opinions were taken, the scale's linguistic validity was performed. Bilingual group

design method was used for the scale's linguistic equivalence and when the correlations between the two implementations were considered, it was observed that there was a positive and meaningful relationship for the entire scale and three sub-dimensions between the scale's Turkish version and the source version. These results demonstrate that the Turkish version of the scale was quite similar to the original version and the Turkish version of the scale was adequate in terms of linguistic equivalence. After the study of linguistic validity, it was observed that there were high correlation values between the target language and the source language and the data collection process was performed. In addition to this, scale's reliability and validity was tested. After the scale's linguistic validity was performed, it was applied to 1006 university students and explanatory and confirmatory factor analyses were performed for the construct validity of the scale. According to EFA results, the KMO value of was 0.91 and Bartlett's test X^2 value of 5119.371 was found meaningful ($p < .001$). Moreover, it was found that the Turkish form of the scale had three dimensions just like the original version and the three dimensional scale explained 54.09% of variance related to the feature it measured. Considering CFA results it was found that the fit indices of the scale consisting 16 items and three factors were meaningful. It can be stated that all of the fit index values of this structural model generated in CFA analysis indicated good fit.

The reliability of the scale was examined with internal consistency and test-retest methods. It was found that Cronbach's alpha coefficient of internal consistency was .87 for "the entire scale", 81 for "Self-Reinforcing" sub-dimension, .73 for "Self-Evaluating" sub-dimension, and .80 for "Self-Monitoring" sub-dimension. Test-retest reliability coefficient was found r = .92 for the "entire scale", r = .82 for the sub-dimension of "Self-Monitoring", r = .73 for the sub-dimension of "Self-Evaluating", and r = .74 for the sub-dimension of "Self- Reinforcing". According to the analysis results, there are 16 items both in the original version and Turkish version of the scale. The scale is assessed on a six-point Likert scale which scores ranging from "0" (very undescriptive of me) to "5" (very descriptive of me) and the total point one can get from the scale changes between 0 and 80. The 7^{th}, 8^{th}, 9^{th}, 10^{th} and 11^{th} items are reverse-coded items. It can be stated that this scale can be used as a valid and reliable measuring tool to identify self-control and self-management skills in conditions in Turkey. The reliability and validity of the self-control-self-management scale performed with the sample consisting of university students reveal that the scale has adequate psychometric features. This scale which is easy and practical to implement and evaluate can be used to determine the self-control and self-management skills.

As regards gender, a meaningful difference in favor of female pre-service teachers was found throughout the scale and all sub-dimensions. Similarly, Uğurluoğlu (2010) revealed that female health professionals' probability of using "Constructive Thinking Model Strategies" was more than the males. However, considering "Self-Monitoring"

(SM), there exits such findings: gender and mathematics achievement was in favor of males (Covarrubias & Stone, 2015), a significant difference did not exist between gender and self-leadership (Carmeli et al., 2006; Kazan, 1999; Kurman, 2001; Razieh et al., 2013; Türköz, 2010) and gender has a meaningful effect on the explanation of variance in self-leadership (Arlı, 2011; Marshall, Kiffin-Petersen, & Soutar, 2012).

In literature, self-management is generally discussed as self-leadership in the field of industry/organizational psychology (Yaka, 2011). It is determined that enhancing perception of self-leadership with education will increase success directly (Özsoy, 2012) and it is anticipated that there might be a relationship between the individuals' perceptions of self-leadership and their levels of reaching individual targets, in other words, their achievement levels (Carmeli et al., 2006). It was found that workers' achievement levels increased with an increase in self-leadership scores (Tabak, Sığrı, & Türköz, 2013). Verifying this information, it was revealed that there was a positive and meaningful relationship between the scores the pre-service teachers got from the entire scale and from all of the sub-dimensions and their academic achievement scores. Similarly, Covarrubias and Stone (2015) found a positive and meaningful relationship between "Self-Monitoring" (SM) and mathematics achievement scores.

If limiting self-control-self-management scale to undergraduate students is considered as a limitation of this study, the further studies can be carried out with much larger variance and larger sample size and thus, it can be suggested that thanks to these studies, it will be useful to re-examine different models related to the factor structure of the measuring instrument via different analysis methods.

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Appendix

Self-Control and Self-Management Scale (SCMS)

Lütfen aşağıdaki ifadelerin her birini okuyunuz ve her bir ifadenin sizi ne kadar iyi betimlediğini aşağıdaki ölçeği kullanarak derecelendiriniz: 5: Beni tamamıyla tanımlıyor. 4: Beni büyük ölçüde tanımlıyor. 3: Beni biraz tanımlıyor. 2: Beni pek tanımlamıyor. 1: Beni çoğunlukla tanımlamıyor. 0: Beni hiç tanımlamıyor.	Beni hiç tanımlamıyor	Beni çoğunlukla tanımlamıyor	Beni pek tanımlamıyor	Beni biraz tanımlıyor	Beni büyük ölçüde tanımlıyor	Beni tamamıyla tanımlıyor
1. Bir şey üzerinde çalıştığım zaman, tüm dikkatimi ona veririm.	0	1	2	3	4	5
2. Yapmam gereken görevlere, onları sevmesem de odaklanırım.	0	1	2	3	4	5
3. Bir amaç uğruna çalışırken, yaptığım şeyin bilincinde olurum.	0	1	2	3	4	5
4. Bir hedef doğrultusunda çalışırken, ilerleyişimi sürekli takip ederim.	0	1	2	3	4	5
5. Zor bir şey üzerinde çalışırken, düşüncelerim üzerinde yoğunlaşırım.	0	1	2	3	4	5
6. Bir amaç doğrultusunda çalışırken, hangi yolu takip edebileceğimi bilirim.	0	1	2	3	4	5
7. Kendim için önemli hedefler belirlediğimde, o hedefleri genellikle başaramam.*	0	1	2	3	4	5
8. Hayatımda karşılaştığım çoğu sorun için net planlar yapma yeteneğine sahip olduğumu düşünmüyorum.*	0	1	2	3	4	5
9. Başardığım hedefler benim için çok şey ifade etmez.*	0	1	2	3	4	5
10. Plan yapmanın faydasız olduğunu düşünüyorum.*	0	1	2	3	4	5
11. Kendim için oluşturduğum standartlar belirsizdir ve bir görevi nasıl yapmam gerektiği konusunda karar vermem zor olur.*	0	1	2	3	4	5
12. Başarı sağladığımda kendimi takdir ederim.	0	1	2	3	4	5
13. Daha sonra tadını çıkarmak için plan yaparak zor işlere girişirim.	0	1	2	3	4	5
14. Başkaları beni takdir etmese de, ben kendimi sessizce takdir ederim.	0	1	2	3	4	5
15. Bir şeyi doğru yaptığımda, bunun tadını çıkarırım.	0	1	2	3	4	5
16. İlerleme sağladığım zaman, kendimi ödüllendiririm.	0	1	2	3	4	5

* Reverse-coded items