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Research Article

Development of a Self-Efficacy Scale toward Piano Lessons

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Abstract

This study aimed to develop a valid and reliable scale to determine students' levels of self-efficacy toward piano lessons. The sample consisted of 456 university-level piano students enrolled in Music Education programs. Experts in language and the field of music were consulted to establish content validity of the items included in the scalar survey applied as a research instrument. Furthermore, a KMO (Kaiser-Meyer-Olkin) sample adequacy test was carried out in the data analysis phase; Bartlett's test was applied to specify the level of factorability for the scale; a principle components factor analysis and confirmatory factor analysis were carried out for the items in the scale; the total correlation of the items was determined; and correlation measurements between subtitles and total points of the scale were performed. In addition, the Cronbach's Alpha coefficient test was applied to determine the scale reliability. To specify the internal consistency and reliability of the scale, the alpha test focused on subtitles, in particular. Additionally, test-retest, test reliability, split-half and cross-validation analyses were carried out to test the validity and reliability of the scale. At the conclusion of these analyses, the "Piano Lesson Self-Efficacy Scale" was accepted as a valid and reliable measurement tool.

Keywords

Piano lessons • Piano education • Self-efficacy • Scale • Development

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Efficacy refers to a person's possession of the knowledge and skills necessary to perform a certain behavior. The efficacy theory, according to Ritter, Boone, and Rubba (2001), entails that people are aware of how they motivate themselves, as well as how they act, think and feel (as cited in [Günhan & Başer, 2007](#)). Another definition of efficacy applies to the social-psychological behavioral theory that emphasizes individuals' beliefs in relation to the effectiveness of their own behaviors, thoughts, and motivation. In other words, the efficacy theory relates to people's awareness of how they motivate themselves in their lives and how they think, act and feel ([Yaman, Koray, & Altunçekiç, 2004](#)).

Beliefs of efficacy are a cognitive motivation that consists of two different structures: self-efficacy and result expectation. In this sense, self-efficacy relates to beliefs in one's personal efficacy with respect to a given task/duty, while result expectation involves beliefs that certain acts will lead to certain consequences (Bandura, 1982, 1977, as cited in [Bıkmaz, 2004](#)). Gibson and Dembo (1984) note the distinction between these two structures and assert that, in cases where individuals believe that they will not be able to perform certain activities, they will either fail to initiate the behavior; or even if they initiate the behavior, they may fail persist in completing it (as cited in [Bıkmaz, 2004](#)). In cases where the activity to be performed relates to learning, individuals who have low self-efficacy, or who cannot perform the necessary behavior, or who do not persist, may never succeed in learning the required knowledge, skills or behaviors. In the cases where they do learn, the process may be delayed due to factors such as maturity, instincts, sense organs, intelligence, age, attention, readiness, lack of stimulation, physical conditions, psychological environment and self-efficacy perception. Thus, self-efficacy perception may be understood as the most basic instinct structure underlying individuals' actions ([Çetin, 2008](#)).

Self-efficacy is an important concept that was brought forward by Bandura in his Social Learning Theory (i.e., Social Cognitive Theory); as he asserts, self-sufficiency is the judgment of an individual concerning his or her ability to organize and achieve a given task ([Günhan & Başer, 2007](#)). Bandura (1986; 1994; 1997) further defined individuals' judgment about how well they are able to perform the actions required to cope with a given situation as self-efficacy perception. In this respect, self-efficacy does not refer to how effective a person is in performing particular skill, but to the person's belief in their ability to perform the skill; and self-efficacy beliefs impact the ways that individuals feel, think, motivate themselves, and act (as cited in [Akkoyunlu, Orhan, & Umay, 2005](#)). Lee (2005) notes that self-efficacy, as a person's belief in him- or herself, may evolve over time based on experience and/or as a result of observing other individuals or listening to the comments of other people (as cited in [Günhan & Başer, 2007](#)).

Self-efficacy defines the aims, decisions, and lifestyle choices of individuals, prompting them to make decisions concerning their capacity to engage in certain activities. As Kauchak and Eggen (1998, p. 162) express, self-efficacy beliefs are an important factor in an individual's motivation for learning. Studies on the subject have shown that individuals with high self-efficacy beliefs show put great effort into achieving a task, do not give up easily when they encounter difficulties, and are persistent and patient (as cited in [Günhan & Başer, 2007](#)). In addition, Pajares (2002) and Zimmerman (1989; 2000) point out that learners with a high level of self-efficacy belief concerning a particular skill or subject adapt more easily, work harder, look for more compelling learning experiences and show more resilience and success when they encounter difficulties in comparison to learners who doubt their learning capacity and skills (as cited in [Ekici, 2012](#)). Hence, it can be said that individuals with high self-efficacy are able to develop strategies for overcoming the difficulties, challenges and problems they encounter in a task.

Self-efficacy is not a passive feature or determinant of the self-system. Rather, it is a dynamic characteristic that is made up of an individual's abilities, level of success in the works he or she performs, and other elements that make up the self-system, such as the motivation and self-regulation mechanisms. If an individual lacks self-efficacy, he or she may exhibit ineffective behaviors despite knowing what to do ([Üstüner, Demirtaş, Cömert, & Özer, 2009](#)).

Self-efficacy beliefs emerge from four sources, as outlined by [Ekici \(2009\)](#):

- a) Direct experience of a similar behavior (complete and accurate experiences);
- b) Opportunities to observe the same type of behaviors in other people (social models);
- c) Being convinced by an authority (verbal conviction);
- d) Perception of one's physiological and emotional states.

[Coşgun and Ilgar \(2004\)](#) similarly highlight the perception of self-efficacy as the combination of an individual's actual capacity, previous success on tasks performed, motivation, and other elements that make up the self-concept. This perception is a determining factor in whether a particular behavior will be initiated and whether it will continue once it has been initiated. Those with high self-efficacy may choose more complex and risky tasks and set their goals high; and they may work ambitiously to achieve these goals. They may also show more sustained effort than those with low self-efficacy perception ([Keskin & Orgun, 2006](#)). On the other hand, as [Aksoy and Diken](#) explain, people tend to avoid situations they feel unable to cope with; and their decisions about how much effort they will put forth, and for how long, on the solution of a problem are determined by their self-efficacy perceptions in relation to

the skill necessary for the solution. Namely, perceived self-efficacy affects not only one's choice of activity and environment, but also the efforts to persist in tasks that one has already started, in accordance with one's expectations of eventual success. Thus, the more powerful the perception of self-efficacy, the more effective the efforts (Aksoy & Diken, 2009).

As previously stated, the perception of self-efficacy is an important element in academic success, and it is a factor in the likelihood that an individual will successfully acquire and permanently retain the information encountered in the learning process. In this respect, Bandura et al. propose the term academic self-efficacy as "individuals' judgments about their capacity to organize the actions that are necessary to achieve pre-planned education achievements and perform these actions" (as cited in Akbaş & Çelikkaleli, 2006). According to Çetin (2008), the perception of self-efficacy plays an important role in revealing students' behaviors and keeping their motivation high; and Jerusalem (2002) similarly reports that a positive self-efficacy expectation increases motivation, ensures the ability to cope with new and challenging tasks, and supports learners in putting forth effort; while a negative self-efficacy expectation causes individuals to fail to initiate a behavior or to abandon a task without completing it (as cited in Yılmaz, Gürçay, & Ekici, 2007).

An important field in which attention and motivation affect success and self-efficacy is music training. One's perception of efficacy in music training affects his or her motivation and ranks among the factors that determine mastery and success in playing a musical instrument. Therefore, determining the self-efficacy perceptions of students with respect to piano lessons, which is among the most important branches in music training, is an important factor in eliminating the deficiencies of students and guiding them in a positive direction. This requires measuring the self-efficacy perceptions and self-efficacy levels of students in musical instrument training, and particularly in piano training, as it is considered as the primary musical instrument.

According to Çapri and Kan (2006), there is a significant deficiency in available tools for measuring self-efficacy. However, recently, there has been considerable progress in the development of self-efficacy scales in specific disciplines, along with scale adaptation studies. Clearly, given the importance of self-efficacy, measurement of this concept is an important field of study for virtually every discipline.

In the context of music training, an examination of the literature concerning the development of self-efficacy scales brings to light several studies. For instance, Özmenteş (2007) developed "The Self-Efficacy Scale Related to Music Ability" in order to measure the level of self-efficacy of students with respect to musical talent as shaped by the opinions and ideas of the students themselves, as well as their close circle of family, friends, and teachers. Similarly, Piji (2007) developed an "Efficacy Perception

Scale in Accompaniment with Piano” in order to measure the perceived efficacy of pre-service music teachers towards school music; while Afacan (2008) developed a “Music Teaching Self-Efficacy Scale” in order to determine the self-efficacy levels of pre-service teachers toward teaching music at the primary level. Additionally, Yildirim (2009) developed a “Self-Efficacy Scale for Playing Violin” in order to reveal the effect of the Kodaly method on violin playing skills, as well as the self-efficacy perception of primary school students and their attitudes towards playing violin. Özmenteş (2011), moreover, designed “The Self-Efficacy Scale on Teaching Music” in order to measure the self-efficacy of music school, primary school and pre-school teachers, as well as pre-service teachers, towards music teaching. Gün (2014) developed “The Piano Performance Self-Efficacy Scale” as a means to measure the piano performance self-efficacy of pre-service music teachers; and Girgin (2015) developed “The Musical Instrument Self-Efficacy Scale” in relation to the personal musical instruments of pre-service music teachers. In terms of their content, the scales in question are related to music skills, piano accompaniment to school songs, general music education, violin training and personal musical instrument performance. Thus, it was observed that there is no evidence in the literature of the existence of a self-efficacy scale for piano lessons.

With this in mind, measurement studies on determining the self-efficacy perceptions of students towards piano lessons in piano training are necessary, as such tools are considered important in ensuring the motivation of students with a low self-efficacy perception. Therefore, this study was carried out in an effort to contribute to the field of piano training by developing a self-efficacy scale relating to the perceptions of students receiving piano lessons.

Objective

The objective of the study was to develop a valid and reliable measurement tool that will help to determine the self-efficacy levels of the students towards piano lessons in light of the literature review.

Method

The study was carried out according to two dimensions in terms of (1) the application of the scale and (2) the analysis of the data obtained. The survey model was used in terms of applying the scale, and a methodological model was used in conducting the analyses.

Population and Sample

The population of the study consisted of piano students studying in Music Teaching Programs of the Fine Arts Education Departments of Faculties of Education. The

sample group itself consisted of 456 piano students studying at the Music Teaching Departments in the Faculties of Education of Karadeniz Technical University, Onsekiz Mart University, Yüzüncü Yıl University, Erzincan University and Mehmet Akif Ersoy University. The simple probability (random) sampling method, one of the probability-based (random) sampling methods, was applied in selecting the sample. Simple probability sampling means choosing a sample from a population under the condition that each member has an equal chance of being selected (Yamane, 2001, p. 13, as cited in Şahin, 2009, p. 122). Here, equality means that there is a chance for each unit in the population to enter the sample, and the information on the hypothesis established by this method must be homogenous in terms of the population (Balci, 2009, p. 92; İslamoğlu, 2009, p. 162). Regarding the size of the population to be determined, Tavşancıl (2014) asserts that the sample sizes must be at several times (at least five) higher than the number of items (questions) on a scale.

Data Collection

After the decision to study the concept of self-efficacy, the subjects of self-efficacy and piano training, as an important dimensions of music training, were investigated. As a result of this investigation, the scope of the subject was determined as self-efficacy towards piano lessons, and the study was framed accordingly. A literature review was performed on the subjects of self-efficacy and piano training, and the information obtained on the subject, as well as on the various self-efficacy scales discovered in this process (e.g., Akkoyunlu et al., 2005; Bozdoğan & Öztürk, 2008; Ekici, 2009; Günhan & Başer, 2007; Özgen & Bindak, 2008; Öztürk, 2008) was explored. As a result of investigating the self-efficacy scales in question, a total of 40 items were created, then revised in terms of spelling and writing style, and an expert opinion was solicited. The relationship of the items to the concept to be measured was established, the non-creation of the factual items and the distribution of the items in the scale were also reviewed, and the options for answers were formed. In this case, five Likert-type answer options were preferred for the scale. The options for responses were determined as “Totally Agree,” “Agree,” “Partly Agree,” “Disagree,” and “Totally Disagree,” from positive to negative. The content (scope) validity of the scale items was ensured through a review by experts in language and music education. Four items were eliminated, and a total of 36 items were selected for the application by the experts in accordance with issues such as expressibility, comprehensibility, suitability to the concept to be measured, lack of repeated expressions, and conformity with the scale used. The items, which were designed to determine the self-efficacy levels of students towards piano playing techniques, success in lessons and exams, playing the piano in front of a group, and using it in teaching, were applied with 456 piano students, and the data obtained from the application were analyzed. The scale that initially consisted of 36 items was reduced to 32 by removing 4 items that were found to have low levels of factor load, item total correlations and reliability levels.

Data Analysis

The SPSS (Statistic Package for Social Science) software and the LISREL (Linear Structural Relations) program were used for the statistical analysis. First, the KMO (Kaiser-Meyer-Olkin) test for sample adequacy was performed to test the adequacy of the data. In addition, Bartlett's test was performed to determine the level of factorability by scale, and the level of significance in this test was measured at $p < .001$. In addition to the KMO and Bartlett's tests, the principal components of factor analysis and confirmatory factor analysis measurements were made regarding the scale items. The item total correlations were determined, and correlation measurements were made between the sub-factors and the total scores of the scale.

Factor analysis is a widely used multivariable statistics technique that aims to find more and less meaningful and more intelligible independent variables (factors) by bringing together many related variables (Büyüköztürk, 2002; Turanlı, Cengiz, & Bozkır, 2012). According to Büyüköztürk (2004), while a factor load value of .45 is a good criterion for selection, this number can be reduced to .30 for scales with a small number of items. On the other hand, Büyüköztürk (2004) emphasized that items with the item total correlation of .30 and above are more distinguishing, and Tavşancıl (2014) emphasized that the correlations of the items in the scale must be .20 and above and positive. In addition, if the value in the KMO test is below .50, it is unacceptable, while .50 is weak, .60 is medium, .70 is good, .80 is very good, and .90 is perfect (Sharma, 1996, as cited in Çelik, 2012). That the KMO value is above .80 in a good factor analysis is important, but values higher than .50 are also acceptable, and the value of the test varies between 0 and 1 (Turanlı et al., 2012). In the factor analysis, the inclusion of factors with the Eigenvalue of 1 and higher is widely used, and these factors are taken as important (Özdamar, 2002, as cited in Büyüköztürk, 2002; Karagöz & Kösterelioğlu, 2008). In factor analysis measurements, a total variance of 30% or above for single-factor scales, and higher for multi-factor scales, and in general, a variance between 40% and 60%, are considered as sufficient in studies carried out in the social sciences (Büyüköztürk, 2004; Tavşancıl, 2014; Şencan, 2005, as cited in Önlü & Saraçoğlu, 2010). It has also been stated that the level of variance should not be lower than 60%, and it must be at least 50% (Altunışık, Coşkun, Bayraktaroğlu, & Yıldırım, 2010).

Researchers frequently choose the techniques of varimax or quartimax for vertical rotation, and oblimin or promax for inclined rotation. A selection may be considered as better when there is a general (single) factor that meets the majority of the variance, and varimax is a multi-factor structure (Büyüköztürk, 2002). On that basis, .40 was taken as the lower limit for the factor load values and factor common variance (commonalities), and the item total correlation lower limit was taken as .30 in the factor analysis measurement, as with various existing studies (e.g., Afacan,

Karakuş, & Uşak, 2013; Bakıoğlu & Kurtuldu, 2015; Bütüner & Gür, 2007; Çetin, Doğan, & Sapmaz, 2010; Dede & Yaman, 2008; Kurtuldu, 2010; Kurtuldu, 2011; Tunca & Sağlam, 2013).

Confirmatory factor analysis (CFA) was performed after the principal component factor analysis. This test is mainly used in scale development or reliability analyses in the social sciences to examine the factor structure of a scale; to verify a structure that has been previously determined or planned by the researcher; to determine whether there is an adequate relationship between the factors determined; to distinguish which variables are related to which factors and whether the factors are independent; and to determine which traditional roots are based on the explanatory factor analysis (Özdamar, 2004, as cited in Çapık, 2014; Erkorkmaz, Etikan, Demir, Özdamar, & Sanioğlu, 2013; Eroğlu, 2003). In the examination of the structure created in the confirmatory factor analysis, the various goodness of fit indexes (χ^2/sd , RMSEA, GFI, AGFI, RMR, NNFI, CFI) were examined, in addition to *t*-values and error variances. Various sources (Çapık, 2014; Çokluk, Şekerci, & Büyüköztürk, 2014; Erkorkmaz et al., 2013; Eroğlu, 2003), have indicated that this must be below 2 for the chi-square/degree of freedom (χ^2/sd); below 5 is also an acceptable fit. Furthermore, an RMSEA value, which points to the fit in the main mass by estimating the covariance in the sample, of lower than .05 shows a perfect fit, and lower than .08 shows a good fit (Çapık, 2014; Çokluk et al., 2014). A GFI value, which is the sample variance explained by the model, and its organized form AGFI, of above .95 shows perfect conformity; above .90 shows good conformity; and lower values show weak conformity (Çokluk et al., 2014). It can be seen that the RMR value, among the other fit indexes, has the same limit of acceptance as the RMSEA value, and the NNFI and CFI values have the same acceptance limits as the GFI value (Çapık, 2014).

The reliability coefficient of Cronbach's Alpha was calculated in determining the reliability of the scale. The Alpha test was performed on the subtitles to determine the internal coherence coefficients of the scale. In addition, test-retest reliability and split-half and cross-validation studies were also performed. In the cross-validity practice, the sample was randomly divided into two groups at such a rate that can represent all of the groups. The factor analysis was applied separately for both groups, and the results were compared to the results obtained from the whole sample. For the test-retest measurement, a 200-person group was again randomly selected from the sample. The Pearson's correlation coefficient was calculated for the data taken from this group one month later, and the Cronbach's Alpha coefficient was again calculated for these data. For the split-half measurement, the Cronbach's Alpha (the first 18 items and last 18 items) coefficient and the Spearman-Brown correlation coefficient was calculated for the whole scale.

According to Acar (2014), cross-validity is used to investigate the invariance of a model in two or more sub-samples that are randomly taken from the same sample group. Dağ (2005) defines cross-validity as showing validity through application with new samples after previously ensuring the validity of a given test. One of the frequently used practices in determining cross-validity is to randomly divide the data into two parts and apply the same measurement method to both groups (Çakmak, 2009; Kavurkacı, Aydın, & Şamlı, 2011). According to Byrne (1998), the objective of cross-validation is to observe whether a model obtained from a sample as a result of the factor analysis can be repeated on the second sample (as cited in Deniz, Özer, & Işık, 2013). In quantitative studies, the term reliability concerns whether the measurement tool can accurately and consistently measure the quality to be measured, and it is among the necessary criteria for assessing the quality of a study (Golafshani, 2003, as cited in Tanyaş, 2014). In establishing reliability of a Likert-type scale, the first step is applying the coefficient developed by Cronbach (Tezbaşaran, 2008, p. 48). In reliability measurements, Cronbach's Alpha coefficient must be as close to 1 as possible for a Likert-type scale (Arslan & Öztunç, 2013; Tezbaşaran, 2008, p. 49). Therefore, if the Alpha internal consistency coefficient is between 0 and .40, the scale is not reliable; if it falls between .40 and .60, the scale is reliable; if it is between .60 and .80, it is quite reliable; and if it is between .80 and 1.00, it is regarded as highly reliable (Özdamar, 2004, as cited in Gürdoğan & Alpar, 2014; Kayış, 2009, p. 405). In addition, one of the oldest methods for calculating the internal consistency of the scale in the process of reliability is the split-half method. According to this method, the scale is applied once, then the questions in the scale are divided into two parts, and the correlation between the parts is calculated (Gözüm & Aksayan, 2003; Kayış, 2009, p. 405). In the test-retest practice, the results are evaluated with the Pearson Product Moment Correlation by applying the scale to another a group chosen from the same sample, or to a different group two times, at regular intervals; and it is expected that the score will be at least .70 (Arslan & Öztunç, 2013; Büyüköztürk, 2004, p. 164).

Findings

As a result of the factor analysis and the item total correlation measurements, four items for which the factor load and item total correlation levels were found to be low were removed from the scale, which had initially consisted of 36 items. After eliminating items 1, 18, 22 and 30, it was determined that the resulting 32-item scale was of a single factor from repeated measurements. Thus, it was found suitable to name it the "Self-Efficacy Perception of Any Kind of Knowledge and Skills Gained in Piano Lessons" scale. The scree plot graph also indicated that the scale represents the single factor weight. However, when the items that make up the scale were analyzed, it was observed that they could be gathered under two subtitles. Accordingly, the knowledge and skills stages were classified under two different subtitles as a means

to create a more intelligible and reasonable order among the items. The resulting subtitles consisted of:

- Self-efficacy towards the level of skills achieved in the piano lesson.
- Self-efficacy towards the level of knowledge and consciousness achieved in the piano lesson.

Table 1
Distribution of the Items by Subtitles

Sub-Tittles	Items
B1	1, 2, 4, 5, 6, 8, 10, 11, 12, 14, 15, 16, 18, 19, 20, 21, 22, 27
B2	3, 7, 9, 13, 17, 23, 24, 25, 26, 28, 29, 30, 31, 32

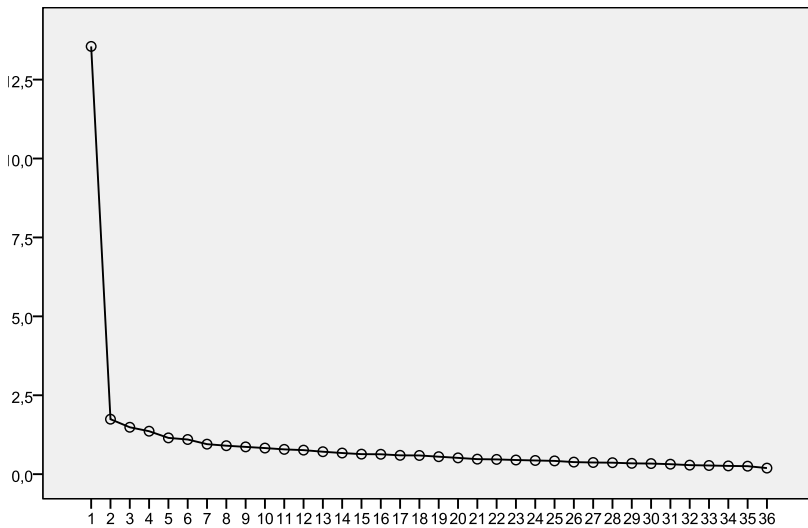


Figure 1. Scree plot graph.

Table 2
Factor Loads of the Items

Items	Whole Scale		Validation		Control	
	Sub-Tittles		Sub-Tittles		Sub-Tittles	
	1	2	1	2	1	2
M26	.72		.71		.73	
M25	.68		.66		.71	
M20	.66		.65		.68	
M14	.65		.63		.66	
M33	.65		.63		.65	
M16	.65		.62		.64	
M32	.63		.62		.63	
M28	.63		.61		.61	
M21	.60		.60		.59	
M24	.59		.60		.59	
M31	.56		.58		.55	
M23	.55		.56		.56	
M10	.54		.53		.53	
M15	.53		.50		.52	
M22	.47		.50		.51	
M27	.46		.47		.46	
M8	.46		.45		.45	
M19	.42		.41		.43	
M17	.40		.40		.41	
M1		.70		.71		.72
M2		.70		.69		.71
M12		.68		.68		.71
M5		.67		.66		.68
M13		.63		.64		.67
M18		.63		.64		.66
M7		.62		.63		.64
M4		.54		.57		.60
M6		.54		.55		.57
M30		.48		.51		.53
M29		.47		.49		.50
M9		.47		.48		.49
M11		.46		.47		.47
M3		.44		.46		.45
Tot. Var.	56.62%		59.89%		62.84%	
SS / M.	23.9 / 91.6		24.8 / 92.3		23.1 / 90.9	
KMO	.95		.92		.93	
χ^2 / p	7969.62 / .000		4164.00 / .000		4621.42 / .000	

In the factor analysis measurement performed by using the Varimax rotation technique, it can be seen that the factor loads in the factor analysis measurement vary between .40 and .72 for both subtitles. Additionally, the total variance explained by 32 items included in the analysis with regard to the scale occurred at the level of 56.62%. As for the measurements applied to the cross-validity study, while the factor loads varied between .40 and .71 in the validity practice, it occurred between

.41 and .73 in the control practice. The total variance explained level was 59.89% for validity and 62.84% for control. The results of the KMO (Kaiser-Meyer-Olkin) sample adequacy test on the whole scale were found to be .95. This result shows that the data obtained by the scale are suitable for the factor analysis. The Bartlett's Sphericity Test level of the scale was found to be significant at the level of $p < .001$ (Bartlett's Test of Sphericity $\chi^2 = 7969.62, p = .000$). In the cross-validity practice, the KMO and Bartlett's measurement results were found to be high and significant. That the standard deviation and mean values on the whole scale and the cross-validity practice are close also supports the positivity of the comparison results between the cross-validity and the whole scale. These results support the finding that the scale is of multi-variable and normal distribution that the sample used is reliable, that it can predict the same structure in different groups, and that it has a strong factor load.

Table 3
Distribution of the Item Total Correlations by Subtitles

Sub-Title1		Sub-Title2	
Item No	r	Item No	r
M26	.68**	M1	.65**
M25	.68**	M2	.63**
M20	.68**	M12	.63**
M14	.66**	M5	.63**
M33	.65**	M13	.62**
M16	.64**	M18	.61**
M32	.64**	M7	.61**
M28	.63**	M4	.59**
M21	.61**	M6	.59**
M24	.61**	M30	.55**
M31	.57**	M29	.54**
M23	.57**	M9	.52**
M10	.55**	M11	.51**
M15	.54**	M3	.51**
M22	.53**		
M27	.52**		
M8	.51**		
M19	.50**		
M17	.50**		

** $p < .01$.

The item total correlations of the scale, which was determined to have single-factor but two subtitles, varied between .50 and .68 under the first sub-title and between .51 and .65 under the second sub-title. According to the findings, the total correlation loads of the items were above the reference limit and high. Accordingly, it is possible to say that the relationship between the items and the self-efficacy concept to be measured is high.

Table 4
Correlation Measurement Results between the Total Scale Score and Subtitles

Measurement Tittles	Whole Scale	Sub Tittle1	Sub Tittle2
Whole Scale	---	.97***	.93***
Sub Tittle1	.97***	---	.84***
Sub Tittle2	.93***	.84***	---

*** $p < .001$.

When table 4 was examined, the correlation results of the total scores obtained from the scale and two sub-factors were found to be quite close to 1.00 and significant at the level of $p < .001$. That the measurement results are significant and high may lead to the idea that the two sub-factors are highly correlated to the concept to be measured and a component of this concept.

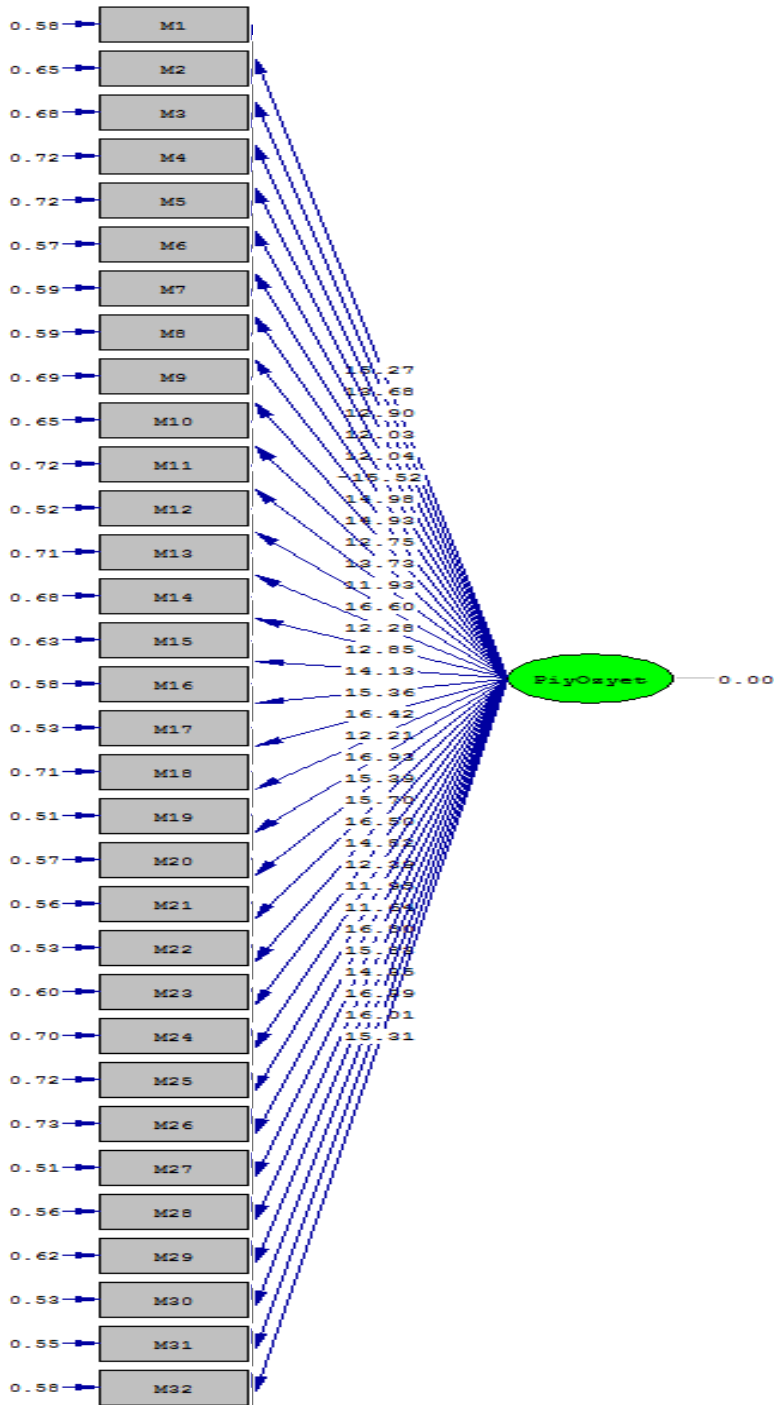


Figure 2. t-values and path diagram related error variances.

Table 5
Goodness of Fit Indexes

χ^2	sd	χ^2/sd	RMSEA	GFI	AGFI	RMR	NNFI	CFI
1262.01	451	2.79	0.063	0.85	0.83	0.061	0.89	0.90

$p < .001$.

Figure 2 shows that all values are significant and acceptable, as the path diagram showing the t -values and error variance (Standardized Solution) coexists. Considering that the parameter estimations for the measurements are significant at the 0.05 level if they exceed 1.96 for the t -value, and at the 0.01 level if they exceed 2.56 (Çokluk et al., 2014), it is understood that all t -values are significant at the level of 0.01 and error variances are low. Taking into consideration the exploratory factor analysis measurements for a total of 32 items, a single-factor CFA analysis was performed for the first trial, and then a trial was made by considering them as two subtitle factors. In both CFA trials, it was seen that the single-factor structure yields healthier results, just as in the EFA measurements. In the first level analysis, suggestions for modification were examined, as some of the fit index values were not within the required interval. A process was carried out in consideration of the positive effect of 4 different combinations of 5 items (4, 5, 30, 31, 32) and the error co-variances to be added in between on the chi-square value, and it was observed that the indexes reached acceptable limits. Upon examining table 5, which includes the goodness of fit indexes, it was seen that the RMSEA value, in which the p -value is significant at the level of .001, and the chi-square and the mean of the degree of freedom occurred within the good fit limits and were close to the limit of the perfect fit. As for the other indexes, it was observed that some were within the limits of good fit and some were within the limits of acceptable fit. According to these results, it can be said that the confirmatory factor analysis results point to an acceptable fit.

Table 6
Scale Test and Re-Test Reliability Measurement Results

Measurement Titles	Reliability α	Test		
		Re-test A	Re-test r	Split Half r
Whole Scale	.95	.94	.90***	.89
Sub-Title 1	.94	.93	.91***	
Sub-Title 2	.94	.93	.87***	

*** $p < .001$.

While the alpha coefficient of the scale was calculated as .95, it was found to be .94 for the two subtitles. The re-test alpha coefficient of the scale was found to be .94. Similarly, the coefficient of both subtitles was found to be .93. The Pearson correlation coefficients for the test re-test measurement were found to be .90 for the whole scale and .91 and .87 for the subtitles. The Spearman-Brown correlation coefficient for the split-half measurement was found to be .89. On the other hand, while the Guttman Split Half coefficient of the scale was found to be .89, the Alpha coefficient for the first

half of the scale was found to be .88, and .91. for the second half. In this case, it can be said that the internal consistency and reliability of the scale are high.

Conclusion and Discussion

In this study, a scale was developed to determine the self-efficacy levels of students towards piano lessons in a piano training program, which makes up an important branch of musical instrument training offered within the scope of music training. The validity and reliability analyses that were carried out have demonstrated that this scale can be used to measure the following aspects of self-efficacy of students in piano lessons;

- Their self-efficacy towards the basic skills, technical level, and working discipline,
- Their self-efficacy towards perceiving and applying what they learn,
- Their self-efficacy towards the level of knowledge achieved and self-assessment.

Upon investigating the findings, it was understood that the items that make up the scale have high values both in the general and in the cross-validity practices. It was also observed that measurement results such as item loads and the level of the total variance explaining, and especially the reliability coefficient and sample adequacy, occurred at the expected level. In this respect, the scale has a single-factor structure in general. It is possible to say that the scale, which is assumed to significantly prove the high-level relations between the scores on all of the items that constitute the scale, as well as the subtitles and the closeness and reliability of the items to the concept to be measured, introduces a significant contribution to the self-efficacy concept in teaching piano. Thus, it is possible to assess the items that constitute the scale in terms of any knowledge and skill level (posture, sitting, playing, finger position, practicing, planning of work, technique, etc.), as with the general approach. Upon examining the scale form, it was observed that the main title could be organized according to two different subtitles, including awareness of knowledge and skills, and the implementation of these acquisitions. This may occur in any case where a scale is required to examine a single concept and to obtain the attitudes and opinions of that concept according to a general overview. Researchers may consider the main concept under more than one subtitle when they create scale items; thus, the scales measure a single concept, and consequently, a single-factor structure may appear in the measurements. However, the scope of the subject is assessed by being classified under individual subtitles. Hence, although certain scales may appear to have single-factor in the factor analysis measurements, researchers may sometimes use subtitles in order to increase the intelligibility or to obtain a richer data set. A similar situation occurred in the current study.

In the related literature, it can be seen that the sample group of the scale developed by [Özmenteş \(2007\)](#) consisted of music teaching students, as with this study. A 5-point Likert-type scale was also preferred, the Alpha coefficient was .90, also at a close rate to the one in this study, and the total variance was also close at 64%. However, unlike this study, the items were gathered under a single factor. Likewise, the scale developed by [Piji \(2007\)](#) had a total variance of 70% and an Alpha coefficient at the level of .94; and Guttman's test and re-test validity studies were carried out in a same manner as this scale. On the other hand, [Piji](#) preferred a lower number of survey items, using a 4-point Likert-type scale with 94 respondents, along with item discrimination. On the contrary, the scale developed by [Afacan \(2008\)](#) was carried out with pre-service primary school teachers, presenting the most distinctive difference from the current study. Its 4-factor structure, 27% lower-upper group measurement and a pilot practice based on preliminary reading are other distinguishing characteristics. However, the Alpha coefficient of the scale was found to be .84, and the variance expression rate occurred as 51.88%, representing similarities to this study. In [Yıldırım's \(2009\)](#) scale, the practices that seem different from the scale in this study are the 4-factor structure and the creation of an item pool by asking students to write a composition on the subject. The rate of explaining the total variance was found to be 57.33%, and the Alpha coefficient was expressed at .96, at a similar rate to this study. Furthermore, the scale developed by [Özmenteş \(2011\)](#) differed from this scale in that it was applied to pre-service primary school and pre-school teachers, as with [Afacan](#). However, the Alpha level of .92 and the rate of explaining the variance of 59% closely resemble this scale. While the scale developed by [Gün \(2014\)](#) bears similarities in that it was applied to pre-service music teachers, and the Alpha level was found to be very close, it differs in its rate of explaining the total variance as 62.50% and its 5-factor structure. Furthermore, the students in [Gün's](#) study were asked to write compositions, just as in the study of [Yıldırım \(2009\)](#). While it bears partial similarities to the scale developed by [Girgin \(2015\)](#) in terms of its application to pre-service music teachers and the initial item pool number (35 items), it demonstrates a difference in terms of its 3-factor structure; also, it has lower values than this scale in terms of the total variance (47%) and the Alpha coefficient (.74).

Among the scales encountered in the literature, it was seen that only the scale developed by [Gün \(2014\)](#) is directly related to piano. However, that scale relates to scope on performance in playing. As such, it focused on the factors of technical level perception, stage anxiety perception and performance level perception in piano performance. Thus, it is seen that this study, which focuses on the subtitles of self-efficacy towards the level of skills achieved in piano lessons and self-efficacy towards the level of knowledge and consciousness achieved in piano lessons, differs from the scale developed by [Gün](#). In this respect, it was determined that there is no similar scale in the literature in terms of determining the self-efficacy perceptions of students

towards piano lessons, with the aim of eliminating the deficiencies of students and guiding them in a positive direction.

Consequently, it can be claimed that this scale can be used in determining the levels of self-efficacy of students towards piano lessons. In addition, the scale can help solve the problems that occur in piano lessons through the determinations and measurements in question and ensure the motivation of students with low self-efficacy. Furthermore, assessing the scale within a wider field of practice and determining piano students' self-efficacy perceptions in this way will help to obtain more robust results. It is essential to broaden the studies on this subject in order to find solutions concerning the self-efficacy perceptions of piano students.

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Appendix

Piyano Dersine Yönelik Öz-Yeterlik Ölçeği

Bu araştırmada piyano öğrencilerinin piyano becerisi ve piyano çalışma disiplinleri açısından kendilerine ait öz yeterliliklerine ilişkin görüşleri elde edilmesi amaçlanmaktadır. Öğrencilerin piyano çalgısıyla ilgili kendilerine ait yeterlilik düşüncelerini ortaya koyması istenmektedir. Lütfen maddeleri dikkatle okuyarak cevaplayınız. Teşekkürler.

Sınıf:

Cinsiyet: Kız Erkek Mez. Old. Lise: Güzel Sanatlar Meslek Lisesi Süper Lise Normal Lise Anadolu Lisesi

MADDELER	Tamamen Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
1-Piyanoda teknik becerimin iyi seviyede olduğuna inanıyorum					
2-Piyanoda temel bazı hareketleri (oturuş, tutuş, vb) doğru yaptığıma inanıyorum					
3-Legato staccato gibi teknik unsurları iyi öğrendiğime inanıyorum					
4-Yeni bir eseri ilk seferde doğru deşifre edebileceğime inanıyorum					
5-Yeni bir eser çalışırken tüm hatalarımı fark edebileceğime inanıyorum					
6-Çalıştığım parçada yanlış yaptığım yerleri kolaylıkla düzeltebileceğime inanıyorum					
7-Piyano çalışma yöntemleri hakkında bilgi sahibi olduğuma inanıyorum					
8-Çalışırken bana uygun yöntemi seçebileceğime inanıyorum					
9-Aldığım piyano eğitiminin beni teknik ve müzikal anlamda yeterli kıldığına inanıyorum					
10-Piyano çalışma düzenimi iyi planlayabildiğime inanıyorum					
11-Kendime özgü bir çalışma disiplinine sahip olduğuma inanıyorum					
12-Piyanoda müzikal olarak (yorum, nüans, vb.) iyi seviyede olduğuma inanıyorum					
13-Piyano çalma stilleri, dönemler, ekoller hakkında bilgi sahibi olduğuma inanıyorum					
14-Yeterince çalışırsam derslerde ve sınavlarda doğru çalabileceğime inanıyorum					
15-Piyanoda karşıma çıkabilecek tüm yeni bilgileri doğru algılayabileceğime inanıyorum					
16-Piyano öğretmenimin verdiği tavsiyeleri harfiyen uygulayabileceğime inanıyorum					
17-Çaldığım eserlerin amacı ve bana kazandıracakları konusunda bilinçli olduğuma inanıyorum					
18-Piyano çalışırken başkasından yardım almadan (başkasından dinlemeden) eseri çözümlenebileceğime inanıyorum					
19-Piyano dersinde verilen örneklere yoğunlaşabileceğime inanıyorum					
20-Derste öğretmenimin isteklerini yerine getirebileceğime inanıyorum					
21-Çalıştığım eserlere kendi yorumumu katabileceğime inanıyorum					
22-Öğrendiğim bilgiler yardımıyla arkadaşlarıma yardımcı olabileceğime inanıyorum					
23-Piyano dersine her dönemde aynı ilgiyi gösterebileceğime inanıyorum					
24-Piyano dersinde öğrendiklerimin başka derslerde de faydalı olduğuna inanıyorum					
25-Piyano dersinde öğrendiklerimin meslek hayatımda bana yardımcı olacağına inanıyorum					
26- Aldığım piyano eğitiminin öğretmenlik hayatım açısından yeterli olduğuna inanıyorum					
27-Piyano öğretmenimin verdiği sorumluluğu taşıyabildiğime inanıyorum					
28-Yanlış kaldığını düşündüğüm arkadaşlarımı eleştirebilecek seviyede olduğuma inanıyorum					
29-Farklı düşüncelerimi piyano öğretmenim ile paylaşabilecek seviyede olduğuma inanıyorum					
30-Piyano eğitimi sürecinde bana neyin faydalı olacağını belirleyebilecek seviyede olduğuma inanıyorum					
31-Piyanoda hangi seviyede olduğumu belirleyerek gerektiğinde çalışma şeklimi gözden geçirebilecek kapasitede olduğuma inanıyorum					
32-Öğretmenimin verdiği tavsiyelerden hangilerinin bana uygun olduğunu belirleyebilecek seviyede olduğuma inanıyorum					