Music Performance Anxiety Scale for High School Students:

Validity and Reliability Study

Mehmet Palancı[1] & Uğur Doğan[2]

[1] *Karadeniz Technical University- Turkey*, [2] *Mugla Sitki Kocman University - Turkey*

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ABSTRACT

This study aims to develop a Music Performance Anxiety Scale (MPAS) for high school students, and to conduct a validity and reliability study. In this respect, a scale will be developed to be used for high school students (adolescents), and differences between the genders will be examined. The study was conducted on 546 high school students. Of these students, 185 (33.9%) were male, 361 (66.1%) were female, and the average age was 16.81 with the ages ranging from 15 to 20. Correlational values of the scale items among themselves and with item totals were examined as a preliminary analysis. As a result of the EFA's principal components technique, promax rotation technique and the analyses, a construct with three factors explaining a total of 42.74% of the total variance was attained. The structure attained was validated by CFA, and fit indices were found to be within the acceptance interval. In the reliability study, Cronbach's alpha internal consistency coefficient was calculated as .86 for the entire scale, 27% for the lower-upper group comparison and test-retest analyses were conducted. The t-test was performed to attain the difference between genders. As a result of the study, a valid and reliable scale was seen to have been developed and a difference between the genders was apparent.

1. Introduction

Music Performance Anxiety (MPA) is one's feeling of being excessively anxious and stressed markedly and persistently with cognitive, affective, somatic and behavioral components while conducting a musical performance. MPA may occur at a controllable level or reach a more intense level. It may emerge only in limited conditions where a musical performance is being conducted or along with other anxiety disorders (Kenny, 2008).

MPA restrains the individual in such a state that he/she makes doubtful, tragic, persistently negative considerations about his/her performance like he/she will be inadequate and unsuccessful. MPA is manifested physically by difficulty in controlling breathing, blushing, trembling, dry mouth, inability to avoid trembling of hands and stomach cramps. Behaviorally, it causes conditions in the individual such as abstaining from the circumstances requiring performance, abandoning, loss of motivation, loss of memory, sleeping difficulty, distracted attention and fidgeting. Conditions like depression, panic and fear are observed in affective terms (Spahn, 2006). In this context, the provision of an MPA diagnosis and psychological assistance services should be considered important. MPA is not an indicator of only a problem limited to this condition, but also of the decline in coping capability. Cognitive therapies and behavioral approaches including drug use were found to be effective in reducing performance anxiety that significantly affects life satisfaction. Moreover, an assistance approach and the development of coping skills were found to be important for reducing MPA and the accompanying general anxiety level (Kenny, 2005). MPA may

lead to the development of various problems due to its presence and level (Kenny & Ackermann, 2008). Consequently, performance anxiety may exhibit effects that may cause an individual to isolate himself/herself, perceive other anxiety-causing conditions more severely and feel bad (Sanderson, DiNardo, Rapee, & Barlow, 1990). Furthermore, the MPA that is commonly observed among adolescents has been identified as a hard-to-bear condition. In this context, the importance of the provision of MPA measurement and assistance services may be considered (Osborne, Kenny, & Holsomback, 2005).

Performance anxiety is discussed in the psychology literature as an important research variable for different social circumstances and circumstances requiring interpersonal relations. In addition, theoretical frames of anxiety research are seen to vary according to the changes in the definitions of anxiety in the DSM-III that was published by the APA in 1980. In particular, distinguishing anxiety from depression and beginning to study it as sub-dimensions of Generalized Anxiety Disorder, Social Anxiety Disorder, Panic Attack, etc. have increased the tendency toward the study of specific topics. Along with this change, performance anxiety is addressed mostly together with social anxiety. However, performance anxiety needs to be studied separately in situational terms, as it can be influenced by generalized anxiety and social anxiety level, and in a process that runs characteristically. This perspective is known to increase the chance of developing more effective and economical interventions especially in the course of assistance.

Many different types of performance anxiety have been defined in the psychology literature. Pargman (2006) defines it as a special type of fear experienced by the individual before a performance. The performance term may generate subjective considerations in explanations of performance anxiety. For instance, while someone is very afraid of exams, another is afraid of speaking in front of his/her colleagues or eating in crowded environments. Performance anxiety is also defined as a continuous anxiety emerging during performances in front of an audience regardless of educational level, skill, gender, age or level of preparation (Salmon, 1990; Wesner, Noyes, & Davis, 1990). This anxiety may affect people regardless of their skill level and age (Steptoe et al., 1995).

When one mentions performance anxiety, the first thing that comes to mind is stage fright in performance arts. According to the psychology literature, stage fright and performance anxiety may be used in place of each other. MPA, a special type of performance anxiety, is a musician's fear of failure, or his/her fear that a potential problem that is likely to occur during a performance could be considered negatively by the audience. For instance, fear is triggered physiologically or psychologically by the expectations from events like a concert, audition or performance exam. Unfortunately, many musicians have discouraging experiences making them believe that they would not be able to fully use their capacities. Hence, their anxiety levels have increased so much that their automatic motor responses are inhibited (Allen, 2010).

Performance anxiety considerably increases before the performance. While trembling, sweating and stress are experienced, cognitive processes like focusing and attention are also affected under several conditions. For instance, even the sense of reality may change when performance anxiety is experienced. Most musicians have experienced having a dry mouth, feeling like they have been punched in their stomachs, having a lump in their throats while gulping, or experiencing a sense of tingling, chilling or sweating on their hands during or before their stage performances. These senses are usually regarded as evidence of performance anxiety (Kirchner, 2003).

Performance anxiety, also named stage fright, is a well-accepted condition that negatively affects many individuals. This fright and anxiety is so strong that the individuals affected by this condition have to abandon many activities like continuing their careers and enjoying life. Performance anxiety is a condition experienced by an individual in front of an audience of any class and size. Performance anxiety is a multi-dimensional phenomenon similar to fright and incorporating cognitive, behavioral and physiological responses. It emerges against a real threat, an inappropriate threat reality or several unknown actuators (Marye, 2011).

Despite studies being carried out on MPA for a long time, and the events and practices based on intensive performance in music teaching departments, faculties of arts or faculties of education in a great majority of universities, and at general and fine art high schools in Turkey, the available studies are limited (Egilmez, 2012; Kafadar, 2009; Teztel, 2007; Yöndem, 2007, 2012).

Studies on MPA have been conducted mainly on adults. Nevertheless, studies concerning the anxiety conditions of children and adolescents at their development stage have been increasing in the respective literature in recent years. A particular focus is placed on studies concerning coping efforts and gender (Boucher & Ryan, 2011). Many scales used to measure MPA are available in the psychology literature. One study incorporated 22 measurement tools developed for measuring performance scales (Osborne & Kenny, 2005). Most of these scales are measurement tools developed for adults and university students. In addition, there are a limited number of studies in Turkey, while there is no scale for measuring MPA. In this context, the present study has two objectives. The first objective is to develop a valid and reliable MPAS for high school students. The second objective of the study is to reveal the MPA of the students going to fine arts high schools and to find the difference between the genders. In this respect, the aim was to prepare a measurement tool capable of measuring the cognitive, affective, somatic and behavioral dimensions of MPA especially for adolescents.

2. Method

2.1. Participants

The sample of this study is comprised of 546 music department students studying at 13 state fine arts and sports high schools located in different regions of Turkey. The average age of the study group was 16.81, with 185 (33.9%) male and 361 (66.1%) female participants. The fact that the students participating in the study have been evaluated within the last six months and experienced music performance presentation as a real life experience was taken into consideration, and the scale was applied to the students representing this condition.

2.2. Procedure

In the course of preparing the scale items, firstly studies conducted on Music Performance Anxiety, Generalized Anxiety and Social Anxiety were examined, and an item pool of 33 items was created. In the next stage, these items were reviewed by three academics who are experts in psychological counseling and guidance and in music teaching fields. As a result of the reviews, a pilot application was initiated with a 33-item scale. The 33 items were applied to a pilot group and the preliminary evaluation showed that none of the items needed to be excluded. The MPAS that was developed was then used for the validity and reliability study. It utilized a 5-point Likert-type rating ("0" never, "1" seldom, "2" sometimes, 3 "often" and 4 "always") and it was administered to the students.

Explanatory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted with respect to the construct validity of the MPAS. The reliability of the MPAS was examined by Cronbach's alpha internal consistency method, lower-upper group examination and test-retest methods. SPSS 11.5 and Lisrel 8.54 programs were used for validity and reliability analyses.

3. Results

3.1. Results Intended for the First Objective

3.1.1. Construct Validity

Explanatory Factor Analysis: In the EFA conducted to examine the construct validity of the MPAS, first, the correlation matrix between all items was examined to check whether a highly significant correlation existed, and significant correlations appropriate to enable factor analysis were seen to exist. The appropriateness of the data for factor analysis was examined by Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's test. KMO must be higher than 0.60 and Bartlett's test must be significant (Çokluk, Şekercioğlu, & Büyüköztürk, 2010). In this study, the KMO sample appropriateness coefficient was found to be .92, Bartlett's test of sphericity X2 was found to be 2699.052 (p<.001), and factor extraction from the answers given to scale items was seen to be possible. In the literature, there is a common opinion that the minimum magnitude for the factor load value of an item must be .30. In addition, the decision as to what the cut-off point for magnitudes of the load must be to evaluate the factor load values is stated to be an issue concerning the researchers' preferences (Çokluk et al., 2010). Based on this opinion, a factor load value of .30 was adopted. In order to determine the factor load value before beginning factor extraction operation, EFA's principal components technique was used to gather more variables by reducing them under less components (Tabachnick & Fidell, 2007) as it gives

psychometric results (Stevens, 2009). Oblique rotation was used since a relation was considered between the items and possible sub-dimensions according to Ho (2006). When the oblique technique was used, the promax rotation technique was used because it was fast and economical (Tabachnick & Fidell, 2007). As a result of the scree plot, the factor analysis was limited to three factors. Thirteen items with factor loads below .30 or with overlapping factor loads were excluded from the scale. A three-factor construct explaining 42.74% of the total variance was attained. Factor loads of the items of each factor are given in Table 1.
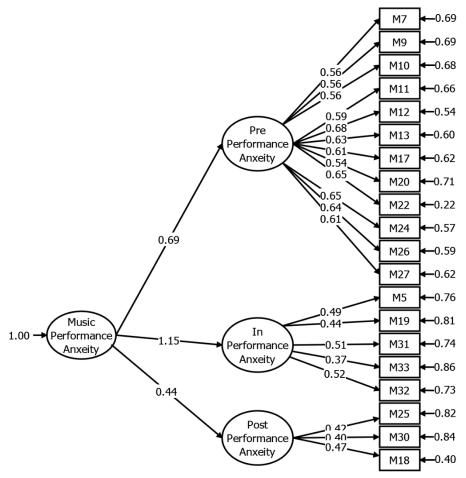
Table 1. Music Performance Anxiety Scale Factor Loads

Item No	Pre-PA	In-PA	Post-PA
10	0.74		
22	0.71		
12	0.71		
7	0.70		
13	0.70		
17	0.69		
24	0.63		
26	0.58		
27	0.57		
20	0.55		
11	0.50		
9	0.43		
33		0.73	
32		0.65	
31		0.51	
5		0.42	
19		0.37	
25			0.73
18			0.61
30			0.60
(Eigenvalue)	5.96	1.45	1.14
Variance (%)	29.80	7.25	5.68

Pre-PA: Pre-Performance Anxiety, In-PA: In-Performance Anxiety

Post-PA: Post-Performance Anxiety

Confirmatory Factor Analysis: Three sub-dimensions were attained for the MPAS by explanatory factor analysis. Level 2 confirmatory factor analysis was conducted to test theoretically whether these three sub-dimensions attained are predicted by the high level variable Music Performance Indicator, which was determined to be the latent variable. In this context, the model was tested by level 2 confirmatory factor analysis to confirm the construct that is theoretically accepted to be correct. The literature states that the fact that the rate of x^2 value to degree of freedom is two or lower shows the model to be a good model, and the fact that it is five or lower shows the model has an acceptable goodness of fit. It is expressed that the fact that the RMSEA value is below .05 shows a good fit value, and that it is below .08 shows an acceptable goodness of fit value. Regarding other values, it is stated that the fact that GFI, AGFI and CFI values are higher than .90 can be considered as the indicator of an acceptable goodness of fit value, and that they are higher than .95 as the indicator of an optimal goodness of fit (Schermelleh-Engel, Moosbrugger, & Müller, 2003). When examining the output file containing the results obtained from the model created for level 2 confirmatory factor analysis, the Chi-square value ($x2=310.91$, sd=167, x2/sd=1.86) was found to be significant, fit index values were found to be RMSEA=.04, GFI=.95, AGFI=.93, CFI=.98, IFI=.98, NFI=.96, RFI=.95, SRMR=.03, and the model is seen to be readily acceptable in this form. Besides these, AIC (396.91) and CAIC (624.93) values

pertaining to the model are lower than the independence model values (7370.22 and 7476.27, respectively). The results are presented in Figure 1.

Chi-Square=310.91, df=167, P-value=0.00000, RMSEA=0.040

Figure 1. Music Performance Anxiety Scale Level 2 Confirmatory Factor Analysis

3.1.2. Reliability Study

Cronbach's alpha internal consistency coefficient and adjusted item-total correlation were used to determine the reliability of the scale, and an uncorrelated t-test was used to test the differences between the item average scores of lower 27% and upper 27% groups created according to the total scores of the test.

Cronbach's Alpha Reliability: Cronbach's alpha internal consistency coefficient values were referred to in order to determine the internal consistency of the scale. It was .86 for the entire scale, .87 for the "Pre-Performance" dimension, .80 for the "In-Performance" dimension, and .81 for the "Post-Performance" dimension. These results show that internal consistency of the scale is at an acceptable level.

Lower-Upper Group Reliability: One of the methods followed in reliability studies is comparison of the lower 27% and upper 27% groups. The t-test results of the 27% lower (n=147) and upper (n=147) groups taken from the study universe were checked to test whether there is a significant difference between the groups. According to the results of the t-test, a significant difference (p<.001) was found to exist between the lower and upper groups.

Test-Retest Reliability: The test-retest method was used to determine the reliability of the scale. Two applications were conducted four weeks apart on a group of 30 people. Pearson's product-moment correlation coefficient was calculated for the reliability study. As a result of the pre-test and the post-test conducted two weeks later, Pearson's product-moment correlation coefficient was found to be .82. According to Tavşancıl (2002), the reliability coefficient is expected to be positive and a minimum of 0.70. Based on this information, the scale can be considered as reliable. The all reliability results are presented in Table 2.

Table 2. Adjusted Item-Total Correlation, T-Values, Cronbach's Alpha Values of Music Performance Anxiety Scale

	Adjusted Item-Total Correlation				t-values			
Item No	For Entire Scale	Pre-P	In-P	Post-P	For Entire Scale	Pre-P	In-P	Post-P
7	.50	.54			-13.22***	-15.75***		
9	.53	.51			-14.41***	-14.31***		
10	.50	.53			-14.07***	-14.83***		
11	.54	.54			-13.63***	-13.62***		
12	.61	.64			-14.91***	-16.85***		
13	.54	.59			-13.52***	-15.11***		
17	.54	.57			-13.45***	-15.56***		
20	.46	.49			-12.30***	-13.14***		
22	.58	.61			-14.98***	-17.07***		
24	.57	.59			-14.46***	-15.28***		
26	.57	.58			-14.78***	-16.37***		
27	.58	.57			-17.27***	-15.70***		
5	.42		.33		-10.84***		-16.10***	
19	.37		.30		-8.51***		-11.47***	
31	.43		.37		-11.47***		-15.28***	
32	.42		.40		-9.82***		-14.08***	
33	.30		.30		-8.32***		-12.43***	
18	.22			.24	-6.04***			-18.60***
25	.17			.27	-4.28***			-13.25***
30	.18			.23	-5.45***			-18.52***
Internal Consistency Coefficient (Alpha)	.86	.87	.80	.81				

n= 546 n1=n2=147 ***p<.001

Pre-PA: Pre-Performance Anxiety, In-PA: In-Performance Anxiety, Post-PA: Post-Performance

3.2. Results Intended for the Second Objective

The second objective of our study is to find the difference between the genders with respect to MPA. The results of the t-tests conducted for independent samples for this purpose are given in Table 3.

Table 3. T- test for MPA by Gender

Factor	Gender	N	Mean	Ss	t	p
Pre-PA	Female	280	20.06	10.86	2.33	.02*
	Male	131	17.51	8.97		
In-PA	Female	280	9.54	4.37	1.29	.19
	Male	131	8.94	4.41		
Post-PA	Female	280	7.63	2.65	1.40	.16
	Male	131	7.22	2.79		
MPA	Female	280	37.24	14.79	2.35	.01*
	Male	131	33.69	13.02		

* p<.05 MPA: Music Performance Anxiety Pre-PA: Pre-Performance Anxiety

In-PA: In-Performance Anxiety Post-PA: Post-Performance Anxiety

A significant difference is observed between genders in respect to the pre-performance anxiety of the students studying in the music department of fine arts high schools [t(409)=2.33, p<.05]. The pre-performance anxiety of female students (=20.06) is higher compared to male students (=17.51). No significant difference was found between in-performance anxiety [t(409)=1.29, p>.05] and post-performance anxiety [t(409)=1.40, p>.05] of the students. In addition, a significant difference is observed when the MPAS is considered as a whole. The MPA of female students (=37.24) is higher compared to male students (=33.69).

4. Discussion and Conclusions

Although numerous scales for MPA are available and they have been studied for many years abroad, no Turkish example is available. Hence, a scale of 20 items was created from the draft scale of 33 items concerning MPA. This scale was then administered to 546 students in the study. The construct validity of the scale was checked in the validity study. Explanatory factor analyses were conducted to determine the construct validity. Çokluk et al. (2010) state that the fact that the total variance declared in scale development studies is higher than 41% and that factor loads of the items are higher than .32 is enough to consider the scale as valid. In order to achieve the declared total variance of 41%, items with factor loads higher than .32 were kept in the scale. When the results attained from the explanatory factor analysis conducted in the study are reviewed in this respect, 20 items included under three factors in the scale are seen to have factor loads higher than .32, and 42.74% of the total variance is seen to be explained. Afterwards, confirmatory factor analysis was conducted for construct validity. As a result of level 2 CFA analyses, optimal fit indices were seen to be attained. The three-dimensional construct attained as a result of the explanatory factor analysis is confirmed by the CFA. Furthermore, the level 2 CFA showed that it was possible to use the scale as a one-dimensional and multi-dimensional scale. Consequently, factor loads, declared variance percentage and CFA fit indices of the MPAS are adequate for construct validity in scale development studies. Thereby, the development of a scale that has simply determined dimensions, that is easy to answer and that is suitable for students through this study is thought to make an important contribution to this field. In this respect, this study could be considered to have achieved its original objective.

The test-retest method was applied to the scale in the reliability study. In the test studies conducted four weeks apart, Pearson's product-moment correlation coefficient was found to be .82. The result attained demonstrated that the scale had an adequate reliability level.

The three-factor construct attained shows similarity with the "Kenny Music Performance Anxiety Inventory (K-MPAI)", which was developed by Kenny, Davis, and Oates (2004) for adult musicians, and the three-dimensional construct of the "Music Performance Anxiety Inventory-Adolescent (MPAI-A)", which is an adaptation of the same scale by Osborne and Kenny (2005) for adolescents. The scale was developed according to Barlow's affective-based anxiety disorders theory. It incorporates the physical and cognitive characteristics dimension including the fright and anxiety of making a fault before and during performance, and the Performance Evaluation dimensions including the Performance Status involving playing solo or as a group, which refers to the nature of the audience, the evaluation as to what is understood by the audience and the performer from the performance, the conclusions derived from this evaluation (especially when a fault is made), and concentration difficulties while performing in front of the audience. Sub-dimensions and most items of the scale designed as pre-in-post-performance by the researchers show similarity with those of the MPAI-A. The item "I cannot avoid trembling and sweating of my hands and body before and while I am on the stage" contained in the pre-performance sub-dimension is similar to the item "Before I perform, I tremble or shake" contained in the physical and cognitive sub-dimension of the MPAI-A. The item "performing in chorus is always better than solo" contained in the in-performance sub-dimension is similar to the item "I would rather play in a group or ensemble" contained in the performance status sub-dimension of the MPAI-A.

Each survey to be conducted with this scale will contribute to the scale's capability to make further reliable measurement. Furthermore, validity and reliability studies may be conducted by adapting the scale to be applied to music students studying at university, professional musicians and other musicians. The short- and long-term prediction validity of the scale should be investigated. In addition, the scale must be applied in adult samples besides student samples to determine whether it can be used validly and reliably.

A difference was found to exist between the genders in terms of MPA in the t-test. Female students somehow experience more anxiety compared to male students in all age groups from six to 25 (Ryan, 1998). In contrast, the study revealed that male students' performance anxiety was higher compared to female students. While there are studies like this supporting that male students experience higher anxiety, when examining the literature, female students are seen to experience more MPA (Abel & Larkin, 1990; LeBlanc,

Jin, Obert, & Siivola, 1997; Nagel, 1988; Widmer, Conway, Cohen, & Davies, 1997). In all of these studies, the MPA of females is higher than the MPA of males.

The results also point out another conclusion. The MPA experienced by the students is higher before performance. It gradually decreases during performance and drops to the lowest level after performance. This result is consistent with the definition given by Pargman (2006). Pargman defines performance anxiety as a special type of fear experienced by the individual before a performance. Moreover, Beck and Emery (1985) provide a similar definition. According to them, performance anxiety is defined as the anxiety of being evaluated that is experienced by the individual before a performance. The individual's anxiety increases with the thought that he/she will be evaluated. In the study conducted by Kokotsaki and Davidson (2003), a similar conclusion was attained. Female students experience more anxiety before performance. This anxiety decreases after performance. The anxieties of male students vary before and after performance as well.

Although it has been studied for a long time abroad, the available results are important as this is the first study conducted on adolescent students studying at fine arts high schools and the first scale developed in Turkey. Future studies are important for the development of the psychometric characteristics of the scale.

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