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Original

Music performance anxiety in 8- to 12-Year-Old children☆

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ABSTRACT

Anxiety can negatively affect performance quality, increasing the likelihood of failure and impaired performance. The aims of this research were: (1) to examine the differences in music performance anxiety (MPA), self-confidence, self-efficacy, and fear of negative evaluation levels among 8- to -12-year-old music students, according to sex, age, and type of instruction; and (2) to propose an explanatory model to describe the origins of MPA. A total sample of 198 music school and conservatory students (54.5 % girls; $M = 9.65$, $SD = 1.25$) completed the MPAI-A, MPAI-A-State, CSAI-2 RE, SMLQ-Ch, and BFNE-S scales. Girls scored significantly higher in self-efficacy, with a medium-high effect size. A model in which State-MPA has an effect on Trait-MPA, both directly and moderated by self-confidence, self-efficacy, and fear of negative evaluation was tested. All fit coefficients were satisfactory, and multi-group analyses showed model consistency across all four groups that were investigated. These results indicate the appropriateness of avoiding stressful performance experiences that could have a negative impact on self-confidence, increasing students' vulnerability to anxiety.

Aprendizaje musical y ansiedad escénica en edades tempranas: 8–12 años

Palabras clave:
Niños
Ansiedad escénica
Autoconfianza
Autoeficacia musical
Miedo a la evaluación negativa

RESUMEN

La ansiedad repercute negativamente en el rendimiento musical, haciendo que la calidad de ejecución esté por debajo del nivel de preparación y de las aptitudes individuales del intérprete. Este trabajo ha tenido dos objetivos: (1) analizar las diferencias en los niveles de ansiedad escénica (AE), autoconfianza, autoeficacia musical y miedo a la evaluación negativa del alumnado de escuela de música y conservatorio de 8-12 años, en función del sexo, la edad y el contexto formativo; y (2) proponer un modelo explicativo para la AE en edades tempranas. Un total de 198 estudiantes (54.5% chicas; $M = 9.65$, $DT = 1.25$) han cumplimentado las escalas MPAI-A, MPAI-A-State, CSAI-2 RE, SMLQ-Ch y BFNE-S. Las chicas han obtenido puntuaciones más elevadas en autoeficacia y el tamaño del efecto asociado ha sido moderado-alto. Se ha puesto a prueba un modelo en el que la AE-estado ejerce efecto directo y también moderado por la autoconfianza, la autoeficacia y el miedo a la evaluación negativa, sobre la AE-rasgo. El modelo ha mostrado índices de ajuste satisfactorios y se mantiene invariante en los cuatro grupos considerados. Estos resultados evidencian la conveniencia de evitar situaciones estresantes que puedan debilitar la autoconfianza del alumnado y aumentar su vulnerabilidad a la ansiedad.

Introduction

Music performance anxiety (MPA) is a complex phenomenon that arises as a result of the combination and interaction of biological, psychological, and environmental factors, and manifests through a variable symptomatology, affecting musical performance (Kenny, 2011). It has two dimensions: Trait-MPA (constant fear or concern about performance) and State-MPA (transient tension and

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apprehension, which vary in intensity and duration). About 20 % of the dropouts in the field of specialized music education are due to MPA (Dalia, 2002).

It is normal to feel a little anxious during a musical performance. However, high levels of anxiety can negatively affect performance and cause rendering quality to be below the performer's level of preparation and musical abilities, becoming a serious problem (Kenny, 2011). The level of anxiety experienced in a music performance context depends on the interaction of three types of factors (Papageorgi, Hallam, & Welch, 2007; Wilson, 2002): (1) personality trait and individual characteristics; (2) aspects related to task performance efficacy: difficulty and mastery of the music to be performed, memorized interpretation, motivation, performing experience, and learning methodology; and (3) issues relating to the setting of the performance itself, such as the audience size or the presence of family/friends among the public.

According to Barlow (2000), anxiety disorders depend on three types of vulnerability: (1) biological, (2) general psychological (tendency toward low self-confidence and self-esteem), and (3) specific psychological. Applied to the musical realm (Kenny, 2011), this model implies that MPA is closely related to: (1) early musical experiences and coping with them, (2) a feeling of general helplessness, and (3) the sense of uncontrollability when performing in front of an audience. Brodsky (1996) understands MPA as an intrinsic feature of music performance career and musicians' particularly stressful lifestyle. Nevertheless, the institutional culture and the learning environment have an influence on students' perception and approaches to performance (Papageorgi et al., 2010a,2010b), and aspects such as the age of onset in musical training, the years of practice, the education level, or the amount and quality of prior performance experiences are also relevant (Casanova, Zarza, & Orejudo, 2018; Zarza-Alzugaray, Orejudo, Casanova, & Aparicio-Moreno, 2018). It is common for children up to 12 years of age to present various evolutionary fears (animals, darkness, the unknown, etc.) that, over time, become anticipatory and can lead to an anxiety disorder (Valiente, Sandín, & Chorot, 2003). In this regard, Osborne and Kenny (2008) claim that performance experiences that take place during childhood and adolescence play a key role in the emergence and evolution of MPA.

In this study, we analyze the state-trait MPA variables, self-confidence, musical self-efficacy, and fear of negative evaluation. This is done in two contexts: music school (amateur learning) and conservatory (professional learning).

Prevalence of music performance anxiety, self-confidence, self-efficacy, and fear of negative evaluation in the musical setting

Epidemiological studies with samples from different countries—mostly professional musicians (Kenny & Ackerman, 20155) and higher education students (Herrera, Jorge, & Lorenzo, 2015; Papageorgi, Creech, & Welch, 2013)—show that MPA affects a considerable number of performers: the estimated overall prevalence rate is 15%–50% (Kenny, 2011). In recent national research (Zarza-Alzugaray, Casanova-López, & Orejudo-Hernández, 2016) involving 479 students from five Spanish higher conservatories, 39 % scored above average.

Children aged 3–4 are known to have elevated cortisol levels before performing in public (Boucher & Ryan, 2011) and anxiety levels increase throughout adolescence (Ballester, 2015; Osborne & Kenny, 2008; Osborne, Kenny, & Holsomback, 2005), reaching their highest level between ages 14–19 years (Patston & Osborne, 2016). Regarding sex differences, girls often consider that the presence of an audience has a negative impact on their performance (Osborne & Kenny, 2005, 2008; Papageorgi et al., 2013), manifesting more anxiety (Dobos, Piko, & Kenny, 2018; González, Blanco-Piñeiro, & Díaz-Pereira, 2018; Orejudo, Zarza-Alzugaray, Casanova, Rodríguez-Ledo, & Mazas, 2017) and with a more weakening effect (Miller & Chesky, 2004; Ryan, 2004).

There is little data on the rate of childhood MPA. In one of the two prevalence studies found—conducted with 1033 primary schoolchildren from the USA—23 % reported anxiety levels that negatively affected their performance (Wang, 2001). In another study carried out in the Region of Murcia (Spain), 21.7 % of the conservatory students aged 9–13 years obtained high scores in Trait-MPA, and 16.3 % obtained very high scores (Ballester, 2015).

In terms of self-efficacy, in research with 404 primary schoolchildren from the UK (Ritchie & Williamon, 2011), girls obtained the highest scores in self-perceived competence ("musical learning"). However, in two studies with adult musicians—conservatory students/professional musicians—boys scored higher in general self-efficacy, as well as in "performance self-efficacy" (González et al., 2018; Orejudo et al., 2017).

No comparative studies have been found on self-confidence and fear of being negatively evaluated or of the prevalence—with the exception of MPA—in the collective and age range under study.

Relationship between music performance anxiety and other influential variables

In addition to sex and age, MPA is associated with trait-anxiety, self-confidence, self-efficacy beliefs, and fear of negative evaluation (Papageorgi et al., 2007). Thus, it has been shown that both anxiety dimensions (Trait-MPA and State-MPA) are closely related (Wilson, 2002) and the latent anxiety trait causes the interpretative quality to be reduced to a greater extent (Kenny, 2011).

On the other hand, the relationship between self-confidence and anxiety (somatic/cognitive) is inversely proportional (Miller & Chesky, 2004). In fact, individuals who score high in self-confidence believe that the anxiety they experience positively influences their performance (Gill, Murphy, & Rickard, 2006).

Self-efficacy depends on the beliefs about one's ability to acquire skills and competencies, and is therefore closely related to self-confidence. It has been found that when self-efficacy decreases, anxiety levels increase (Papageorgi et al., 2010b) and the perception of (in)effectiveness with respect to music learning—s̈elf-efficacy for musical learning¨—can predict the quality of a performance (Ritchie & Williamon, 2012).

According to Nicholson, Cody, and Beck, (2015), the degree of anxiety experienced in a stressful situation has to do with basic fears, such as the fear of being negatively evaluated by others. As adolescence approaches, fear of negative evaluation becomes more relevant and, with age, fear of criticism increases (Kenny, 2011). On another hand, studies with adolescent students show that those who wish to dedicate themselves professionally to music tend to present lower levels of MPA (Braden, Osborne, & Wilson, 2015; Osborne et al., 2005). It is usually more common to find this student profile in conservatories than in music schools. In addition, conservatory students are more accustomed to performing in public and have more opportunities to develop coping strategies (Papageorgi et al., 2010a).

Numerous investigations have attempted to study MPA in musicians of different ages, genres, and styles. However, very few address this problem in music performers aged 8–12. This work responds to the need to bridge this gap and contribute to progress in this field.

Taking into account the previous considerations, two objectives were established: (1) to assess the presence of differences in the levels of state-trait MPA, self-confidence, musical self-efficacy, and fear of negative evaluation in music school students and 8–12 years old, depending on sex, age, and formative context; and (2) to propose a representative model of the relationships between the target variables that explains MPA at an early age. The following

Table 1
Sample characteristics

N = 198	Age			Instrument group						
	8-9 years *n* (%)	10-12 years *n* (%)	Subtotal *n* (%)	Strings[a] *n* (%)	Woodwinds[a] *n* (%)	Brass[a] *n* (%)	Percussion[a] *n* (%)	Keyboard i. *n* (%)	Other i. *n* (%)	Total *n* (%)
Conservatory students										
Girls	12 (6.1)	17 (8.6)	29 (14.6)	12 (28.6)	8 (19)	3 (7.1)	1 (2.4)	5 (11.9)	–	29 (69)
Boys	3 (1.5)	10 (5)	13 (6.6)	5 (11.9)	1 (2.4)	5 (11.9)	1 (2.4)	1 (2.4)	–	13 (31)
Subtotal	15 (7.6)	27 (13.6)	42 (21.2)	17 (40.5)	9 (21.4)	8 (19)	2 (4.8)	6 (14.3)	–	42 (100)
Music school students										
Girls	38 (19.2)	41 (20.7)	79 (39.9)	15 (9.6)	31 (19.9)	8 (5.1)	–	19 (12.2)	6 (3.9)	79 (50.6)
Boys	41 (20.7)	36 (18.2)	77 (38.9)	4 (2.6)	23(14.7)	16 (10.3)	3 (1.9)	13 (8.3)	18 (11.5)	77 (49.4)
Subtotal	79 (39.9)	77 (38.9)	156 (78.8)	19 (12.2)	54 (34.6)	24 (15.4)	3 (1.9)	32 (20.5)	24 (15.4)	156 (100)
Total simple										
Girls	50 (25.3)	58 (29.3)	108 (54.5)	27 (13.6)	39 (19.7)	11 (5.6)	1 (.5)	24 (12.1)	6 (3)	108 (54.5)
Boys	44 (22.2)	46 (23.2)	90 (45.5)	9 (4.6)	24 (12.1)	21 (10.6)	4 (2)	14 (7.1)	18 (9.1)	90 (45.5)
Total	94 (47.5)	104 (52.5)	198 (100)	36 (18.2)	63 (31.8)	32 (16.2)	5 (2.5)	38 (19.2)	24(12.1)	198 (100)

Brass = trumpet (11), horn (9), trombone (8), and tuba (4); Keyboard Instruments = piano (32), electronic keyboard (3), accordion (2), and harpsichord (1); Other Instruments = drums (7), classic guitar (5), electric guitar (5), choir (4), txistu [Basque flute] (1), trikitixa [Basque button accordion] (1), and ballet (1); Strings = violin (16), viola (9), double bass (6), cello (3), and harp (2); Woodwinds = clarinet (26), transverse flute (14), saxophone (10), oboe (9), and bassoon (4).

[a] "Symphonic" instruments.

hypotheses were formulated: (1) Girls will score higher than boys in state-trait MPA and in musical self-efficacy; (2) at older ages, higher state-trait MPA and lower self-confidence will be observed; (3) music school students will obtain—with respect to conservatory students—higher scores in state-trait MPA; (4) state-MPA will be negatively associated with self-confidence and positively associated with fear of negative evaluation; and (5) at these ages (8–12 years), state-MPA will have a direct effect, and also an indirect effect, through self-confidence, self-efficacy, and fear of negative evaluation, on trait-MPA.

Method

Participants

The reference population is the Guipuzcoan group of music school (amateur training) and conservatory students (regulated studies to obtain a professional degree), ranging in age from 8 to 12 years. In order for both teaching modalities to be represented, the registration data of the Basque Institute of Statistics were consulted. Participant selection was incidental and took place at two public music institutions in San Sebastián (Guipúzcoa). The sample was made up of 42 students (69 % girls; $M = 10.07$, $SD = 1.24$) of the "Francisco Escudero" Professional Conservatory of Music (Elementary Learning) and 156 from the "Municipal School of Music and Dance" (50.6 % girls; $M = 9.53$, $SD = 1.24$), Level II or Initiation, aged between 8–12 years. As can be seen in Table 1, the range of instruments covers 25 different specialties, mostly from the symphonic branch (68.7 %).

Measures

Music Performance Anxiety Inventory for Adolescents (MPAI-A; Osborne & Kenny, 2005; adapted to Spanish by our research team). Although this was designed to measure trait-MPA in adolescent musicians (12–19 years), it is suitable for children aged 8–12 years. It consists of 15 items grouped into three subscales: *somatic and cognitive symptoms* (8 items), *performance context* (3 items), and *performance evaluation* (4 items). The response format is a 7-point Likert type, ranging from 0 = not at all to 6 = all of the time with the total score ranging from 0 to 90; higher scores indicate higher anxiety. In this study, the confirmatory factor analysis (CFA) has shown an acceptable fit of the data to the theoretical model proposed by the authors ($\chi^2_{85} = 129.50$, $p = .001$, $\chi^2/df = 1.52$, CFI = .904, IFI = .908, SRMR = .060). The Cronbach alpha and McDonald omega coefficients, the Composite Reliability (CR), and Extracted Mean Variance (EMV) for the total score were: $\alpha = .77$, $\Omega = .83$, CR = .88 and EMV = 73.05 %, respectively. In the subdimensions, these indicators had the following values: (1) *Somatic and cognitive symptoms*, $\alpha = .72$, $\Omega = .80$, CR = .72, and EMV = 26.43 %; (2) *Performance context*, $\alpha = .43$, $\Omega = .73$, CR = .47, and EMV = 24.09 %; and (3) *Performance evaluation*, $\alpha = .41$, $\Omega = .60$, CR = .41, and EMV = 21.82 %.

Music Performance Anxiety Inventory for Adolescents (State, Performance) (MPAI-A-State; Braden et al., 2015; adapted to Spanish by our research team). This is a specific 12-item tool with 7 response options, 0 = not at all, 6 = all of the time, that evaluates state anxiety before a musical performance. It includes two sub-dimensions: *somatic and cognitive symptoms* (8 items) and *performance evaluation* (4 items). The total score is obtained by adding the scores, and varies between 0 and 72. The results of the CFA were: $\chi^2_{53} = 151.55$, $p < .001$, $\chi^2/df = 2.86$, CFI = .882, IFI = .884, and SRMR = .059. The internal consistency, CR, and EMV indices for the total items were: $\alpha = .87$, $\Omega = .92$, CR = .89, and EMV = 40.05 %. In the respective sub-dimensions, these indicators had the following values: (1) *Somatic and cognitive symptoms*, $\alpha = .84$, $\Omega = .91$, CR = .84, and EMV = 40.78 %; and (2) *Performance assessment*, $\alpha = .70$, $\Omega = .87$, CR = .71, and EMV = 38.60 %.

Competitive State Anxiety Inventory 2 Reduced (CSAI-2 RE; Martens, Burton, Vealey, Bump, & Smith, 1990; adapted to Spanish by Arruza, González, Palacios, Arribas, & Cecchini, 2012) [Subscale of Self-confidence]. This is designed to measure pre-competitive anxiety in sports settings, but previous studies support its validity and reliability for use in this context (Iusca & Dafinoiu, 2012). The *self-confidence* subscale consists of 5 items, with the total score ranging from 0 to 20. In this research, CFA showed a good fit of the data to the theoretical one-dimensional model ($\chi^2_5 = 13.63$, $p = .018$, $\chi^2/df = 2.73$, CFI = .983, IFI = .983, and SRMR = .028). In addition, the values of the coefficients, $\alpha = .87$, $\Omega = .94$, CR = .88, and EMV = 59.7 %, suggest that the overall reliability of the scale is adequate.

Self-efficacy for Musical Learning Questionnaire - Children's version (SMLQ-Ch; Ritchie & Williamon, 2011; adapted to Spanish by our research team). This assesses beliefs of self-efficacy about musical learning and can be applied to children 7 years old and older. It consists of 11 items that are rated as 1 = not at all sure, 0%–7 = completely sure, 100%, resulting in a total score range of 11–77 points. The results of the CFA showed an acceptable fit of the data to the theoretical one-dimensional model ($\chi^2_{41} = 59.32$, $p = .032$, $\chi^2/df = 1.45$, CFI = .933, IFI = .937, and SRMR = 0.057). In addition, reliability ratings were, $\alpha = .70$, $\Omega = .87$, CR = .69, and EMV = 18.53 %.

Brief Fear of Negative Evaluation Scale - Straightforward Items (BFNE-S; Carleton, Collimore, McCabe, & Antony, 2011; adapted to Spanish by our research team). This determines the degree of fear of negative evaluation. It consists of 8 items rated on a 5-point Likert response scale ranging from 1 = not at all characteristic of me to 5 = very characteristic of me. The minimum possible score is 8 and the maximum score is 40. A total score of 25 or more is considered indicative of a possible case of clinically significant social anxiety. In this research, CFA showed a good fit of the data to the theoretical model (χ^2_{20} = 39.53, p = .006, χ^2/df = 1.97, CFI = .968, IFI = .969, and SRMR = 0.041). Given the values α = .87, Ω = .91, CR = .87, and EMV = 46.9 %, the overall reliability of the scale was good.

Procedure

Upon obtaining the favorable report from the Human Research Ethics Committee of the UPV/EHU, the intellectual property of the material to be used was verified. For the adaptation of the scales to Spanish, considering the characteristics of the constructs to be measured (Muñiz, Elosua, & Hambleton, 2013) and following the recommendations of Hambleton and Patsula (1999), a back-translation process was carried out. In order to avoid problematic items and to ensure adequate understanding of the items, pilot tests were conducted, which also allowed estimating the application time required. Participation was voluntary and conditioned by the delivery of the Informed Consent Document, duly completed and signed. The instruments were administered collectively, and data collection was carried out in two one-hour sessions. To ensure the confidentiality and anonymity of the data, each participant was identified with a five-digit numeric code. The instructions and statements of the items were read aloud, and the order of application of the tests was the same for everyone. The MPAI-A-State and CSAI-2 RE scales were completed in the second session, a few minutes before a small individual performance in front of the class. After data collection, the relevant analyses were carried out using the SPSS and AMOS v.24 software.

Data analysis

Initially, the quality of the data was verified, and evidence of the validity and reliability of the measuring instruments in this sample was obtained, considering desirable values above 0.70 and 50 %, for CR and EMV, respectively. For the analysis of differences, the sample was divided into two age groups (8–9/10–12) and, after verifying the parametric assumptions of normality (K–S) and homocedasticity, five independent analyses of variance were carried out. The estimation of the effect size of the paired differences was done with Hedges' *g'*, taking as reference the values 0.2, 0.5, and 0.8, respectively, for small, medium and large effect sizes (Rosenthal, 1994).

In order to model the relationships between the variables, path analyses were carried out and, to check the moderating effect of sex and age, multi-group invariance analyses were conducted. These analyses allow establishing the degree of invariability of the model and determining whether the proposed relationship pattern is consistent with the data observed in each group. The calculation of the estimates was done using the maximum likelihood method. However, as the assumption of multivariate normality was not met, further bootstrap analyses were carried out with the Bolle-Stine method. The results obtained with the two methods did not reveal significant differences in any of the analyses, so the results corresponding to the original sample were studied. To analyze the model's fit to the data, the χ^2, χ^2/df, IFI, CFI, RMSEA, and SRMR indexes were used. A good fit is considered with significance levels associated with χ^2 > .05; values for the ratio χ^2/df < 3; IFI and CFI > .95; and RMSEA and SRMR < .05; and an acceptable fit with the ratio χ^2/df < 5; IFI and CFI > .90; and RMSEA and SRMR < .08 (Hu & Bentler, 1999). Following Cheung and Rensvold (2002), the acceptance criterion of the configural, metric, and strict invariance models used was that the difference in the CFI between two immediate models should be 0.01.

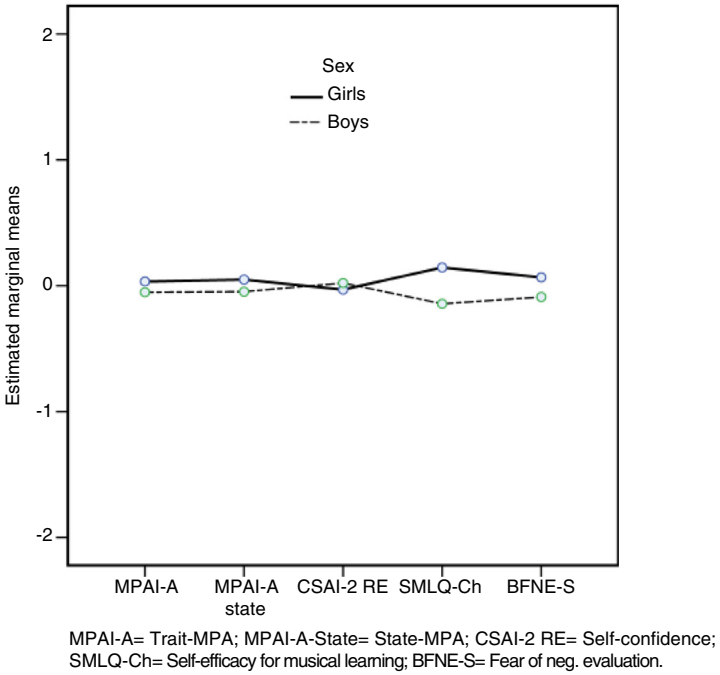

Figure 1. Graphic representation of students' psychological profile according to sex.

Results

Differences in state-trait music performance anxiety, self-confidence, musical self-efficacy, and fear of negative evaluation, depending on sex, age, and formative context

Based on the effect size, the sex differences were small and statistically irrelevant, with the exception of musical self-efficacy (SMLQ-Ch), where girls obtained higher scores, with an associated moderate-high effect size, $F(1, 190) = 8.07$, p < .005; g' = .44. Age and type of instruction had no significant influence on any of the variables considered, either separately or through interaction (see Figure 1 and Table 2).

Relationship between state-trait MPA, self-confidence, musical self-efficacy, and fear of negative evaluation

After confirming the pair-wise association, a theoretical model was tested that contemplates the relationships between all five variables simultaneously. Namely, the fit of a model was tested in which state-MPA exerts influence on trait-MPA, directly and also indirectly, through self-confidence, musical self-efficacy, and fear of negative evaluation (see Figure 2).

The goodness-of-fit indexes for the sample as a whole were: χ^2_2 = 6.24, p = .044, χ^2/df = 3.11, with SRMR = .041, IFI = .981, CFI = .981, and RMSEA = .104 [.015, .201].

Table 3 shows the model fit tests, based on sex and age range. The χ^2/df ratio, as well as the other indexes for girls, boys, and the two age groups, were satisfactory, so the model fits the four groups separately.

The total and indirect effects are presented in Table 4.

Table 2
Means and standard deviations (in parentheses) by sex, age group, and formative context

N = 198	Sex			Age group			Formative context			
	Girls	Boys	*t; p*	8-9 years	10-12 years	*t; p*	Conservatory	Music school	*t; p*	Total
1. Trait-MPA	43.80 (14.32)	38.58 (16.11)	2.41; .017	41.74 (13.84)	41.13 (16.65)	.28; 781	43.88 (14.02)	40.76 (15.65)	1.17; .243	41.41 (15.34)
2. State-MPA	23.93 (17.01)[a]	19.43 (14.12)[b]	1.98; .049	22.72 (15.29)[c]	21.13 (16.46)[d]	.70; .487	18.02 (16.77)	22.96 (15.53)[e]	−1.79; .075	21.89 (15.89)[f]
3. Self-confidence	16.31 (4.32)[a]	17.60 (3.27)[b]	−2.31; .022	16.77 (3.78)[c]	17.01 (4.07)[d]	−.42; .677	17.12 (3.62)	16.84 (4.01)[e]	.41; .680	16.90 (3.92)[f]
4. Self-efficacy	68.35 (6.47)	65.02 (8.72)	3.08; .002	67.99 (7.06)	65.80 (8.20)	2.00; .046	66.60 (7.28)	66.90 (7.88)	−.23; .819	66.84 (7.74)
5. Fear neg. eval.	18.18 (8.55)	17.42 (8.50)	.62; .537	18.40 (9.08)	17.32 (7.98)	.90; .371	7.10 (7.64)	18.03(8.75)	−.63; .528	17.83 (8.52)

[a] *n* = 106;
[b] *n* = 88;
[c] *n* = 93;
[d] *n* = 101;
[e] *n* = 152;
[f] *n* = 194.

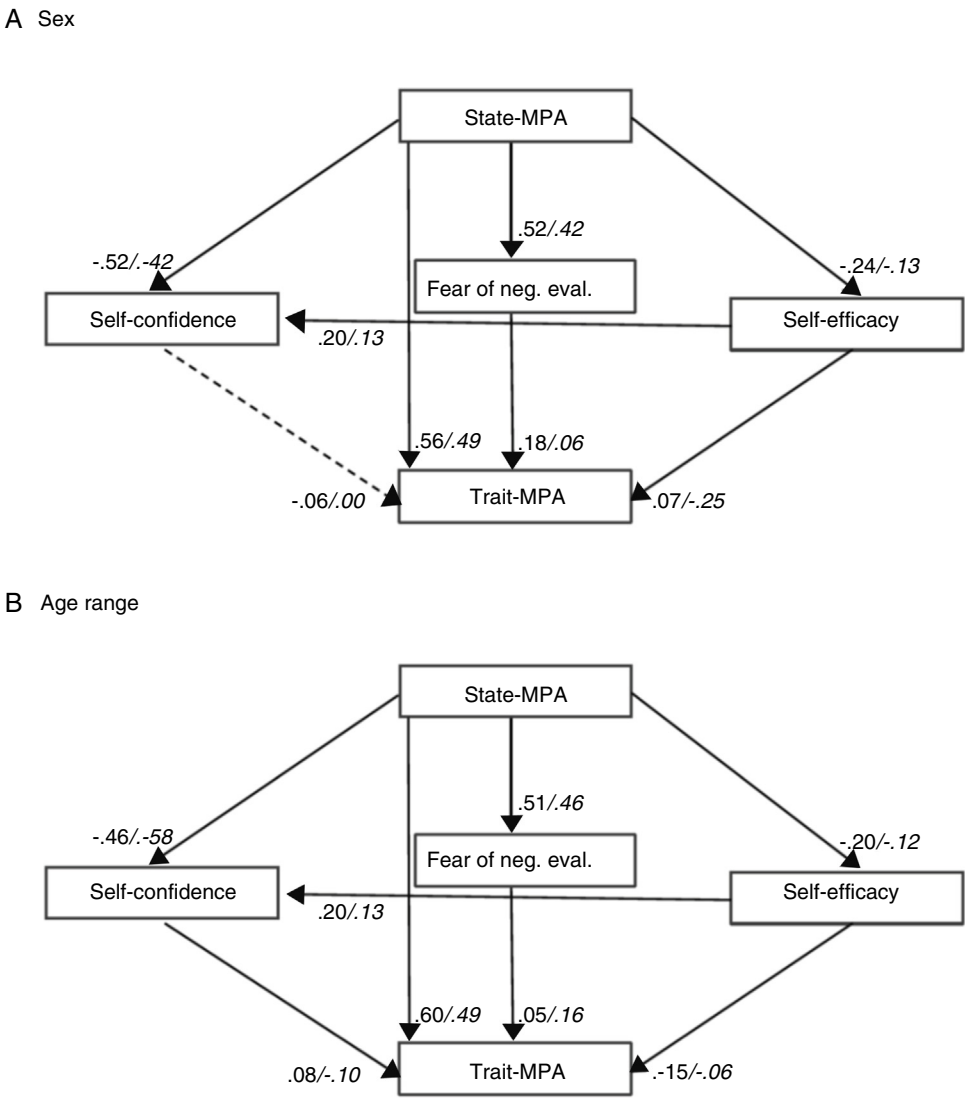

Figure 2. Relationships between variables based on A) sex (italics correspond to boys' values) and B) age range (italics correspond to values in the age range 10–12 years). All values are standardized coefficients. The dashed line represents nonsignificant relationships between the variables in the two groups.

As shown in Table 5, in the sex analyses, increases in CFI (ΔCFI) did not exceed the limit of .01 until adding constraints on the intercepts, so the hypothesis of configural and metric invariance was accepted. As for the age groups, the results allowed us to accept the level of strict factorial invariance between the samples.

Discussion

Anxiety can negatively impact musical performance, promoting unhealthy coping strategies. The first objective of this work was to determine the existence of significant differences in the levels of state-trait MPA, self-confidence, musical self-efficacy, and fear

Table 3
Fit indexes and R^2 for the model by sex and age range

Group	χ^2	*df*	*p*	χ^2/df	SRMR	IFI	CFI	RMSEA (95% CI)	R^2 MPAI-A in %
Sex									
Girls	7.49	2	.024	3.74	.058	.965	.963	.161 (.050-0.289)	46.9
Boys	2.11	2	.348	1.05	.037	.999	.998	.025 (.000-0.213)	36.7
Age									
8-9 years	.926	2	.629	0.46	.024	1.01	1.00	.000 (.000-.161)	40.9
10-12 years	4.78	2	.091	2.39	.047	.978	.976	.116 (.000-.255)	41.0

CFI = comparative fit index; *df* = degrees of freedom; IFI = incremental fit index; *p* = *p-value;* RMSEA = root mean squared error of approximation; RMSEA 95 % CI = 95 % confidence interval of RMSEA; RMSR = mean root of standardized residuals; R^2 MPAI-A = R-squared Trait-MPA; SRMR = standardized root mean square residual; $\chi 2$ = Chi-Square test; χ^2/df = Chi-Square degree of freedom ratio.

Table 4
Total and indirect (standardized) effects based on sex and age range

	Total effect				Indirect effect	
	MPAI-A-State	SMLQ-Ch	BFNE-S	CSAI-2 RE	MPAI-A-State	SMLQ-Ch
Girls						
SMLQ-Ch	−.241					
BFNE-S	.525					
CSAI-2 RE	−.563	.197			−.047	
MPAI-A	.664	.058	.178	−.056	.108	−.010
Boys						
SMLQ-Ch	−.126					
BFNE-S	.419					
CSAI-2 RE	−.434	.127			−.016	
MPAI-A	.550	−.251	.061	.001	.057	
8-9 years						
SMLQ-Ch	−.198					
BFNE-S	.508					
CSAI-2 RE	−.462					
MPAI-A	.616	−.154	.049	.083	.017	
10-12 years						
SMLQ-Ch	−.120					
BFNE-S	.458					
CSAI-2 RE	−.579					
MPAI-A	.617	−.064	.157	−.096	.135	

BFNE-S = Fear of negative evaluation; CSAI-2 RE = Self-confidence; MPAI-A = Trait-MPA; MPAI-A-State = State-MPA; SMLQ-Ch = Self-efficacy.

Table 5
Fit indexes for multi-group invariance models by sex and age range

Model	χ^2	*df*	*p*	$\Delta\chi^2$	$p\ \Delta\chi^2$	CFI	ΔCFI
Sex							
Unconstrained	4.657	4	.324	NE	NE	.997	NE
Structural weights	13.808	11	.244	9.152	.242	.987	.010
Structural intercepts	33.245	15	.004	19.43	.001	.917	.070
Structural means	36.863	16	.002	3.618	.057	.905	.012
Structural covariances	40.041	17	.001	3.180	.075	.895	.010
Structural residuals	58.031	21	.000	17.99	.001	.831	.064
Age group							
Unconstrained	16.738	6	.010	NE	NE	.952	NE
Structural weights	23.285	13	.038	6.54	.478	.954	.002
Structural intercepts	28.315	17	.041	5.03	.284	.949	.005
Structural means	28.592	18	.054	.277	.599	.952	−.003
Structural covariances	29.013	19	.066	.421	.517	.955	−.003
Structural residuals	35.393	23	.048	6.38	.173	.944	.011

NE = not estimable.

of negative evaluation in students of specialized music education aged between 8–12 years, depending on sex, age, and formative context (music school/conservatory). With the exception of self-efficacy, sex differences did not achieve statistical significance, and the absence of significant variations in state-trait MPA levels contradicts research findings that reported anxiety levels in female adolescents and youth (Dobos et al., 2018; González et al., 2018; Orejudo et al., 2017; Osborne & Kenny, 2008; Thomas & Nettelbeck, 2014). Also, neither age nor formative context influenced any of the variables of interest. Differences may have been statistically insignificant due to the sample size. As no prevalence studies of self-confidence and fear of negative evaluation were found, we could not contrast these results with those obtained in previous research.

The first hypothesis suggested that girls would score higher than boys in state-trait MPA and musical self-efficacy. The results were consistent with the conclusions of previous studies (Dobos et al., 2018; González et al., 2018; Orejudo et al., 2017; Osborne & Kenny, 2008; Ritchie & Williamon, 2011; Ryan, 2004; Thomas & Nettelbeck, 2014) and girls obtained higher scores, both in state-trait MPA and in self-efficacy, with the latter being statistically significant. In addition, the related-measures ANOVA revealed the existence of a generic group profile, which, except for self-efficacy, presented no individual differences in the

three factors considered, so the hypothesis was partially confirmed.

In turn, it was hypothesized that students' anxiety would increase with age, negatively affecting their self-confidence. There is reason to think that, as the years go by, the likelihood of accumulating negative performance experiences increases, and with it, vulnerability to MPA. Contrary to the study of Osborne et al. (2005), in which differences were observed, the results obtained in this research show that the effect of age is not relevant. Moreover, despite the absence of significant differences, the 8-9-year-olds scored somewhat higher in state-trait MPA, and somewhat lower in self-confidence, so the hypothesis was not confirmed. This discrepancy could be explained by the profile of the participating students, because in the work of Osborne et al. (2005), they were young interpreters of very high level and were also older. However, our small number of 12-year-olds (n = 10) may have conditioned these results.

Another hypothesis stated that music school students would report higher levels of MPA. Although the differences were not significant, conservatory students scored higher in trait-MPA, and music school students scored higher in state-MPA. These results partially support the argument of Osborne et al. (2005) that students who aspire to pursue professional music tend to show lower levels of anxiety. Children who attend music schools seek to initiate musical learning and receive basic amateur-style training, without the initial intention of becoming professional performers. As Papageorgi et al. (2010b) pointed out, conservatory students are more accustomed to giving performances and therefore, have more options to develop strategies to deal with MPA. In external evaluation situations, music school students may not feel confident about their musical skills and therefore, show higher levels of state-MPA. The third hypothesis is therefore partially confirmed. However, as the number of conservatory participants was lower than the number of music school students, these results should be taken with caution.

With the second objective, an explanatory model for MPA was sought, integrating the variables and deepening out understanding of this early-age phenomenon. It is assumed that—contrary to the case of adult musicians—students of this age have not had time to experience sufficiently traumatic situations to generate the emergence of an anxious personality trait. It is therefore expected that exposure to anxious situations related to musical performances and the negative consequences that may arise from them will contribute to the emergence of trait-MPA. The more negative the performance experiences the young musician suffers, the greater the fear of negative evaluation, which will decrease his or her self-confidence. Based on this argument, a model was evaluated where state-MPA influences trait-MPA, directly and indirectly, moderated by self-confidence, musical self-efficacy, and fear of negative evaluation.

In accordance with the hypothesis, a direct association was found between the state-trait MPA and the fear of negative evaluation, and inversely with self-confidence and self-efficacy, so the fourth hypothesis is confirmed. These results support the findings of previous research (Miller & Chesky, 2004; Nicholson et al., 2015) and show that the state-trait MPA variables, self-confidence, musical self-efficacy, and fear of negative evaluation are closely related: the greater the fear of being negatively evaluated by others, the lower the self-confidence, and anxiety levels increase.

The fifth hypothesis stated that, at an early age (8–12 years), state-MPA has a direct effect on trait-MPA, self-confidence, self-efficacy, and fear of negative evaluation, and an indirect effect—moderated by all of the former—on trait-MPA. The proposed model has a good fit in the four groups separately: girls/boys, 8–9/10–12 years. It is therefore clear that children of this age are at a vulnerable moment for the onset of anxiety disorders, and that experiences of negative performance can harm their self-confidence and promote, firstly, the emergence of state-MPA, subsequently lead to trait-MPA. On the other hand, the change of sign in the relationship between the variables self-efficacy and trait-MPA (model A), and self-confidence and trait-MPA (model B), is probably due to the small size of the samples with which the structural models work when multi-group analysis by sex and age are performed.

With this work, we intended to make up for the lack of studies of the variables analyzed in music students aged 8–12 years and to provide relevant information to better understand this problem in childhood and pre-adolescence, so it is doubly novel. The low CFI and IFI and EMV percentage of the state-MPA scale, together with the sample—the sampling technique used, lower participation rate of conservatory students, and the small number of students aged 12—and the data collection outside of a context of "real" performance and exclusively through self-assessment tests, limit the scope of the results obtained. In future research, the tests should be administered before performances that are relevant to the students (such as an exam, a concert, or an audition) and complemented by physiological measures of anxiety or information from other sources, such as families and teachers.

It has been found that a significant percentage of 8–12-year-olds do not develop coping strategies or have effective tools for anxiety management. Therefore, further research is needed to improve music teaching and learning, through the implementation of MPA-prevention programs, and/or the introduction of subjects that provide strategies to reinforce students' self-confidence and help reduce MPA at an early age.

Conflicts of interest

None.

References

Arruza, J. A., González, O., Palacios, M. E., Arribas, S., & Cecchini, J. A. (2012). Validación del Competitive State Anxiety Inventory 2 Reducido (CSAI-2 RE) mediante una aplicación web [Validation of the Competitive State Anxiety Inventory 2 Reduced (CSAI-2 RE) using a web application]. *Revista Internacional de Medicina & Ciencias de la Actividad Física & del Deporte*, *12*(47), 539–556. http://cdeporte.rediris.es/revista/revista47/artvalidacion300.pdf

Ballester, J. http://hdl.handle.net/10803/307540, 2015

Barlow, D. H. (2000). Unraveling the mysteries of anxiety and its disorders from the perspective of emotion theory. *The American Psychologist*, *55*(11), 1247–1263. http://dx.doi.org/10.1037/0003-066X.55.11.1247

Boucher, H., & Ryan, C. A. (2011). Performance stress and the very young musician. *Journal of Research in Music Education*, *58*(4), 329–345. http://dx.doi.org/10.1177/0022429410386965

Braden, A. M., Osborne, M. S., & Wilson, S. J. (2015). Psychological intervention reduces self-reported performance anxiety in high school music students. *Frontiers in Psychology*, *6*(195), 1–9. http://dx.doi.org/10.3389/fpsyg.2015.00195

Brodsky, W. (1996). Music performance anxiety reconceptualized: A critique of current research practices and findings. *Medical Problems of Performing Artists*, *11*(3), 88–98.

Carleton, R. N., Collimore, K. C., McCabe, R. E., & Antony, M. M. (2011). Addressing revisions to the Brief Fear of Negative Evaluation Scale: Measuring fear of negative evaluation across anxiety and mood disorders. *Journal of Anxiety Disorders*, *25*(6), 822–828. http://dx.doi.org/10.1016/j.janxdis.2011.04.002

Casanova, O., Zarza, F. J., & Orejudo, S. (2018). Differences in performance anxiety levels among advanced conservatory students in Spain, according to type of instrument and academic year of enrolment. *Music Education Research*, *20*(3), 377–389. http://dx.doi.org/10.1080/14613808.2018.1433145

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*(2), 233–255. http://dx.doi.org/10.1207/S15328007SEM0902_5

Dalia, G. (2002). *Cómo superar la ansiedad escénica en músicos*. Madrid: IdeaMúsica.

Dobos, B., Piko, B. F., & Kenny, D. T. (2018). Music performance anxiety and its relationship with social phobia and dimensions of perfectionism. In *Research studies in music education*. Advance online publication. http://dx.doi.org/10.1177/1321103X18804295

Gill, A., Murphy, F., & Rickard, N. S. (2006). A preliminary examination of the roles of perceived control, cortisol and perceptions of anxiety in music performance. *Australian Journal of Music Education*, *1*, 32–47.

González, A., Blanco-Piñeiro, P., & Díaz-Pereira, M. P. (2018). Music performance anxiety: Exploring structural relations with self-efficacy, boost, and self-rated performance. *Psychology of Music*, *46*(6), 831–847. http://dx.doi.org/10.1177/0305735617727822

Hambleton, R. K., & Patsula, L. (1999). Increasing the validity of adapted tests: Myths to be avoided and guidelines for improving test adaptation practices. *Journal of Applied Testing Technology*, *1*(1), 1–30.

Herrera, L., Jorge, G., & Lorenzo, O. (2015). Ansiedad escénica musical en alumnos de flauta travesera de conservatorio. *Revista Mexicana de Psicología*, *32*(2), 169–181.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55.

Iusca, D., & Dafinoiu, I. (2012). Performance anxiety and musical level of undergraduate students in exam situations: The role of gender and musical instrument. *Procedia-Social and Behavioral Sciences*, *33*, 448–452.

Kenny, D. T. (2011). *The psychology of music performance anxiety*. New York: Oxford University Press.

Kenny, D. T., & Ackerman, B. (2015). Performance related musculoskeletal pain, depression, and music performance anxiety in professional orchestral musicians: A population study. *Psychology of Music*, *43*(1), 43–60.

Martens, R., Burton, D., Vealey, R. S., Bump, L. A., & Smith, D. E. (1990). Competitive State anxiety inventory-2. In R. Martens, R. Vealey, & D. Burton (Eds.), *Competitive anxiety in sport* (pp. 117–190). Champaign, IL: Human Kinetics Books.

Miller, S. R., & Chesky, K. (2004). The multidimensional anxiety theory: An assessment of and relationships between intensity and directions of cognitive anxiety, somatic anxiety, and self-confidence over multiple performance requirements among college music majors. *Medical Problems of Performing Artists*, *19*(1), 12–20.

Muñiz, J., Elosua, P., & Hambleton, R. K. (2013). Directrices para la traducción & adaptación de los tests: Segunda edición. *Psicothema*, *25*(2), 151–157. http://dx.doi.org/10.7334/Psicothema2013.24

Nicholson, D. R., Cody, M. W., & Beck, J. G. (2015). Anxiety in musicians: On and off stage. *Psychology of Music*, *43*(3), 438–449.

Orejudo, S., Zarza-Alzugaray, J., Casanova, O., Rodríguez-Ledo, C., & Mazas, B. (2017). The relation of music performance anxiety (MPA) to optimism, self-efficacy, and sensitivity to reward and punishment: Testing Barlow's theory of personal vulnerability on a sample of Spanish music students. *Psychology of Music*, *45*(4), 570–583. http://dx.doi.org/10.1177/0305735612463950

Osborne, M. S., & Kenny, D. T. (2005). Development and validation of a Music Performance Anxiety Inventory for gifted adolescent musicians. *Journal of Anxiety Disorders*, *19*(7), 725–751.

Osborne, M. S., & Kenny, D. T. (2008). The role of sensitizing experiences in music performance anxiety in adolescent musicians. *Psychology of Music*, *36*(4), 447–462. http://dx.doi.org/10.1177/0305735607086051

Osborne, M. S., Kenny, D. T., & Holsomback, R. (2005). Assessment of music performance anxiety-inventory in late childhood: A validation study of the Music Performance Anxiety Inventory for Adolescents (MPAI-A). *International Journal of Stress Management*, *12*(4), 312–330.

Papageorgi, I., Creech, A., & Welch, G. (2013). Perceived performance anxiety in advanced musicians specializing in different musical genres. *Psychology of Music*, *41*(1), 18–41. http://dx.doi.org/10.1177/0305735611408995

Papageorgi, I., Haddon, E., Creech, A., Morton, F., de Bezenac, C., Himonides, E., ... Welch, G. (2010a). Institutional culture and learning I: Perceptions of the learning environment and musicians' attitudes to learning. *Music Education Research*, *12*(2), 151–178. http://dx.doi.org/10.1080/14613801003746550

Papageorgi, I., Haddon, E., Creech, A., Morton, F., de Bezenac, C., Himonides, E., ... Welch, G. (2010b). Institutional culture and learning II: Inter-relationships between perceptions of the learning environment and undergraduate musicians' attitudes to performance. *Music Education Research*, *12*(4), 427–446. http://dx.doi.org/10.1080/14613808.2010.520432

Papageorgi, I., Hallam, S., & Welch, G. (2007). A conceptual framework for understanding musical performance anxiety. *Research Studies in Music Education*, *28*(1), 83–107. http://dx.doi.org/10.1177/1321103X070280010207

Patston, T., & Osborne, M. S. (2016). The developmental features of music performance anxiety and perfectionism in school age music students. *Performance Enhancement & Health*, *4*(1), 42–49. http://dx.doi.org/10.1177/0305735611408995

Ritchie, L., & Williamon, A. (2011). Primary school children's self-efficacy for music learning. *Journal of Research in Music Education*, *59*(2), 146–161. http://dx.doi.org/10.1177/0022429411405214

Ritchie, L., & Williamon, A. (2012). Self-efficacy as a predictor of musical performance quality. *Psychology of Aesthetics, Creativity, and the Arts*, *6*(4), 334–340. http://dx.doi.org/10.1037/a0029619

Rosenthal, R. (1994). Parametric measures of effect size. In H. Cooper, & L. V. Hedges (Eds.), *The handbook of research synthesis* (pp. 231–244). New York, NY: Russell Sage Foundation.

Ryan, C. A. (2004). Gender differences in children's experience of musical performance anxiety. *Psychology of Music*, *32*(1), 89–103. http://dx.doi.org/10.1177/0305735604039284

Thomas, J. P., & Nettelbeck, T. (2014). Performance anxiety in adolescent musicians. *Psychology of Music*, *42*(4), 624–634. http://dx.doi.org/10.1177/0305735613485151

Valiente, R. M., Sandín, B., & Chorot, P. (2003). *Miedos en la infancia y la adolescencia*. Madrid: UNED.

Wang, J. C. (2001). A study of performance anxiety in talented music students. *Bulletin for Research in Elementary Education*, *7*, 1–67.

Wilson, G. D. (2002). *Psychology for performing artists* (2nd ed.). London: Whurr.

Zarza-Alzugaray, F. J., Casanova-López, O., & Orejudo-Hernández, S. (2016). Estudios de música en los conservatorios superiores y ansiedad escénica en España. *Revista ElectrÃ³nica Complutense de InvestigaciÃ³n En EducaciÃ³n Musical - RECIEM*, *13*, 50–63. http://dx.doi.org/10.5209/RECIEM.49442

Zarza-Alzugaray, F. J., Orejudo, S., Casanova, O., & Aparicio-Moreno, L. (2018). Music performance anxiety in adolescence and early adulthood: Its relation with the age of onset in musical training. *Psychology of Music*, *46*(1), 18–32. http://dx.doi.org/10.1177/0305735617691592