

Predicting Different Dimensions of Music Performance Anxiety in Young Adolescents: The Role of Gender, Psychological Vulnerability, and Music Self-efficacy

Predição de Diferentes Dimensões da Ansiedade na Performance Musical em Jovens Adolescentes: O Papel do Género, da Vulnerabilidade Psicológica e da Autoeficácia Musical



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Abstract: The present study aimed to examine sociodemographic, music-related, and psychological predictors of music performance anxiety (MPA) in a group of 145 adolescent music students. The study also aimed to confirm the bifactorial structure of the Portuguese version of the MPAl-A. Results from the CFA showed an appropriate fit of the bi-dimensional organization of MPA into two dimensions: cognitive-somatic and performance. The results showed that each dimension of MPA was predicted by different variables: cognitive-somatic MPA was predicted by gender (female),

higher levels of emotional and behavioural problems, and lower levels of music self-efficacy; performance MPA was predicted by lower levels of music self-efficacy. Results highlight the importance of mental health and motivational cognitions, particularly the role of emotional and behavioural problems and self-efficacy on MPA.

Keywords: music performance anxiety. adolescents. MPAl-A. CFA. predictors

Resumo: O presente estudo teve como objetivo analisar os preditores sociodemográficos, relacionados com a música e preditores psicológicos da ansiedade na performance musical (APM) num grupo de 145 adolescentes estudantes de música. O estudo procurou ainda confirmar a estrutura bifatorial da versão portuguesa do MPAl-A. Os resultados da AFC revelaram uma adequação apropriada da organização bidimensional da APM em duas dimensões: cognitivo-somática e de performance. Os resultados indicaram que cada dimensão da APM foi predita por diferentes variáveis: a APM cognitivo-somática foi predita pelo género (feminino), por níveis mais elevados de problemas emocionais e comportamentais e por níveis mais baixos de autoeficácia musical; a APM de performance foi predita por níveis mais baixos de autoeficácia musical. Os resultados destacam a importância da saúde mental e das cognições motivacionais, particularmente o papel dos problemas emocionais e comportamentais e da autoeficácia na APM.

Palavras-chave: ansiedade de performance musical. adolescentes. MPAl-A. AFC. preditores

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Introduction

Music Performance Anxiety (MPA) is defined as a persistent and accentuated experience of apprehension and anxiety related to musical performance, manifested through emotional, cognitive, somatic, and behavioural symptoms. MPA can be experienced in different contexts of musical performance, in a temporal sequence of pre, during, and post-performance (Kenny 2011; Papageorgi 2022). MPA can occur in different age groups, including young musicians (Dempsey & Comeau 2019; Kenny & Osborne 2006). MPA tends to impact musicians' quality of life and professional career (e.g., Lupiáñez *et al.* 2022).

Considering the prevalence and impact that MPA has had on young musicians, it is essential to explore its predictor variables. The literature suggests that the main predictors of MPA are related to individual variables and variables associated with tasks, performance and musical context (Burin & Osorio 2017; Lupiáñez *et al.* 2022; Papageorgi 2022).

In young musicians, one of the individual variables related to MPA is age. Adolescents seem to experience significantly higher levels of MPA than children (Nusseck *et al.* 2015; Osborne & Kenny 2005; Patston & Osborne 2016; Sârbescu & Dorgo 2014), and similar levels as found in adult musicians (Osborne & Kenny, 2008). Regarding gender, although not consistently, different studies have reported higher levels of MPA in female musicians (Fernholz *et al.* 2019; Iusca & Dafinoiu 2012; Papageorgi, 2022; Thomas & Nettelbeck 2014; Vaag *et al.* 2016). Females tend to show greater concern and more dysfunctional thoughts associated with performance, which may lead to higher MPA levels (Oudejans *et al.* 2017; Robichaud *et al.* 2003). In addition, the impact of external performance evaluations seems to trigger a greater lack of confidence in females than in males (Wentzel *et al.* 2016), which could have an impact on their musical performance. In young music

students, research shows that girls tend to develop higher levels of MPA, due to a more negative motivational cognitions' pattern, such as low self-efficacy beliefs (Kenny *et al.* 2014; Kenny & Ackermann 2015; Papageorgi *et al.*, 2011).

Motivational factors in musical performance have been described as good predictors of MPA, being determined by interactions between the context and the musician's cognitions (Zarza-Alzugaray 2014; Zarza-Alzugaray *et al.* 2018). Low levels of self-efficacy are associated with a negative bias in the self-evaluation of past performances and with higher concerns about the consequences of poor performance (Kenny & Osborne 2006; Nicholson *et al.* 2015). In this sense, the research by González and collaborators (2018) and the study by Papageorgi (2022) corroborate these assumptions by demonstrating the strong predictive value of low levels of self-efficacy in the APM dimension, in the younger target audience. In a recent study conducted in China, self-efficacy showed to act as a partial moderator between MPA and career expectations in high-school music students, suggesting that enhancing music self-efficacy can boost students' future career aspirations and reduce the negative effects of MPA (Wang & Yang, 2024).

Another individual variable associated with MPA is perfectionism. Recent research has shown a significant predictive value of perfectionism, both self-oriented and socially prescribed, on young musicians' MPA (Dobos, *et al.* 2019; Papageorgi 2022).

Finally, the predictive value of psychological vulnerability has been considered relevant in MPA, as suggested by Barlow's model of anxiety (Barlow 2000). Most research has focused on specific anxiety-related comorbid symptoms. Thomas and Nettelbeck (2014), in a study with adolescent musicians, found that trait anxiety explained 35% of the variance of MPA. Lupiáñez *et al.* (2022) also found that fear of negative evaluation, social avoidance, and depression are strong predictors of MPA in young musicians. However, despite the results shown in these studies, literature on the construct of generalized psychological vulnerability and its

predictive value in the development of MPA in young musicians is still scarce.

This Study

The present study aimed to examine sociodemographic, music-related, and psychological predictors of two dimensions of music performance anxiety – cognitive and somatic dimension, and performance dimension – in adolescent music students.

Method

Participants

The study included data on 145 music students (44.1% female) from three specialized music education institutions in Portugal. Students' age ranged from 12 to 14 years old ($M = 13.37$; $SD = 0.99$). Fifty-five students were enrolled in the 7th grade, 43 in the 8th grade, and 47 in the 9th grade. Regarding the instruments played by the participants, 64 of them played strings instruments (45.4%), 34 played keyboard instruments (24.1%), 31 played wind instruments (22%), six studied percussion instruments (4.3%), and six were singers (4.3%). Participants reported studying a musical instrument for a period between two and 12 years ($M = 6.92$; $SD = 2.03$) and studying between less than an hour and 17 hours per week ($M = 3.73$; $SD = 2.74$). Concerning their academic performance in the instrument, participants reported grades between 2 and 5 (using a 5-point grade scale) ($M = 4.26$; $SD = 0.69$) at the time of the last evaluation period.

Instruments

Sociodemographic questionnaire. This part of the survey was developed by the research team to collect sociodemographic data such as (i) sex; (ii) age; (iii) academic school year; (iv) instrument played; (v) instrument practice time per week; (vi) academic grade in the instrument at the time of the last evaluation period; (vii)

intrinsic motivation for studying the instrument, using a 5-point Likert scale ("How much do you like studying this instrument?"; 1 = not at all; 5 = very much).

Music Performance Anxiety Inventory for Adolescents (MPAI-A; Osborne & Kenny 2005; Portuguese version: Dias et al.. 2022). The MPAI-A was developed as an assessment instrument for music performance anxiety in adolescents. It includes 15 items related to situations before, during, and after a musical performance. Participants respond to the items using a 7-point Likert scale (0 = not at all; 6 = all the time). The original version of the MPAI-A is organized around three factors (Somatic and Cognitive Features; Performance Context; Performance Evaluation) (Osborne & Kenny 2005). The preliminary validation of the Portuguese version of the MPAI-A suggested, through an Exploratory Factor Analysis, a 2-factor structure (Cognitive and Somatic Dimension; Performance Dimension). Reliability scores for this factorial structure are adequate (Cognitive and Somatic Dimension $\alpha = .84$; Performance Dimension $\alpha = .76$; Total Score $\alpha = .88$ (Dias et al.. 2022).

Youth Self-Report (YSR; Achenbach et al.. 2014). The YSR is a self-report measure for the assessment of emotional and behavioural problems in adolescents aged between 11 and 18 years old. It includes 112 items, organized in eight syndromes, which are organized in the second-order scales of Internalizing Problems (e.g., "I cry a lot"), Externalizing Problems (e.g., "I physically attack people"), and Total Problems. Participants are requested to rate their functioning over the last six months using a Likert scale anchored with the descriptors: 0 (not true), 1 (somehow or sometimes true) and 2 (very true or often true). The psychometric properties of YSR were assessed and revealed adequate (Achenbach et al.. 2014). In the Portuguese normative sample, YSR alpha coefficient was $\alpha = .93$ for Total Problems, $\alpha = .84$ for Internalizing Problems, and $\alpha = .85$ for Externalizing Problems. In this study, the Total Problems scale was used as an indicator of general psychopathological vulnerability.

Child-Adolescent Perfectionism Scale (CAPS) (Flett et al., 2000; Portuguese version: Bento et al., 2014). The Child-Adolescent Perfectionism Scale is a self-report questionnaire with 22 items, with a bifactorial structure: 1) self-oriented perfectionism – perfectionist behaviours and self-imposed beliefs (e.g., item 1: “I try to be perfect in everything I do”); and 2) Socially prescribed perfectionism – reflecting the perception of excessively high expectations from significant others regarding the participants’ performance (e.g., item 15: “Other people always expect me to be perfect”) (Bento et al., 2014). Each item is responded to using a 5-point Likert scale (1 = false-not at all true of me; 5 = very true of me). This measure showed appropriate psychometric properties, with an excellent internal consistency ($\alpha = .88$ for the total score; $\alpha = .85$ for Self-oriented perfectionism; $\alpha = .81$ for Socially prescribed perfectionism) (Bento et al., 2014).

Self-Efficacy for Musical Learning Questionnaire (Williamson & Ritchie 2010; Portuguese version: Mikusova 2013). The Self-Efficacy for Musical Learning Questionnaire assesses the self-efficacy beliefs of participants regarding their musical performance. It includes 11 items (e.g., item 1: “I am sure that I can learn the music for this concert”). Participants respond using a 7-point Likert scale (1 = 0%, not at all sure to; 7 = 100%, completely sure). This questionnaire showed adequate psychometric properties ($\alpha = .78$) (Mikusova 2013).

Data collection procedures

The study obtained ethical approval by the Scientific Council of the Faculty of Education and Psychology of Universidade Católica Portuguesa (5/2022). Three music schools/conservatories were invited to participate in this study. After receiving authorization from the schools’ principals, parents of students aged between 12 and 14 years-old were informed of the study through an e-mail message, inviting their children to participate. Parents who accepted the invitation provided their written consent for data collection with the students. The administration of questionnaires occurred in class, in two of the schools. Previously, there was a brief explanation to the students about the framework of the

project, ensuring anonymity and confidentiality of each participant. In the third conservatory, data collection took place in an online format, using the Qualtrics platform. Parents received information about the study and had opportunity to authorize, or not, the participation of their students. In case of consent, parents received a QR code to be shared with the students, allowing the access to the questionnaire by the participants.

Data analysis overview

The data were analysed using AMOS, *version 26.0* (Arbuckle 2019), and the *Statistical Package for Social Sciences* [SPSS], *version 27.0* (IBM Corporation 2019).

To confirm the bifactorial structure of the MPAl-A suggested in a previous study (Dias *et al.*, 2022), a confirmatory factor analysis was conducted, using AMOS, using data from the current study.

Descriptive statistics were calculated for sociodemographic data. Pearson, Spearman, and point-biserial correlations were calculated to examine the association between variables. Multiple linear regressions were used to analyse predictors of MPA (cognitive/somatic dimension; performance dimension).

Results

Confirmation of the factor structure of the MPAl-A

A confirmatory factor analysis was performed with the MPAl-A items, testing a two-factor structure suggested by a previous study (Dias *et al.*, 2022). The bi-dimensional model showed adequate goodness-of-fit indices ($\chi^2 (88) = 255.685$; $2/df = 1.77$; CFI = 0.91; NNFI = 0.82; RMSEA = 0.073).

Standardized regression weights ranged from .45 to .73 (Performance dimension) and from .46 to .77 (Cognitive/somatic dimension) (see table 1).

Table 1 - Standardized regression weights of MPAl-A items

Dimension	Item	Estimate
Performance	3	.459
	7	.734
	10*	.558
	11	.682
	14	.446
Cognitive/somatic	1	.738
	2	.536
	4	.766
	5	.638
	6	.712
	8	.633
	9	.589
	12	.766
	13	.459
	15	.624

*reverse-scored item

Exploratory associations between MPA, sociodemographic, music-related, and psychological variables

Correlations between the main variables in the study were performed, in order to select the variables – sociodemographic variables (participants’ sex and school grade), music-related variables (instrument academic performance, instrument practice, time of music learning, and degree of preference for the instrument played), and psychological variables (music self-efficacy, emotional and behavioural problems, and perfectionism) – to include in the regression analyses as predictors of MPA (see table 2).

MPA is significantly correlated to the main psychological variables assessed, but different patterns of association were found between the two MPA dimensions and other variables, particularly related to sociodemographic and music-related variables. The MPA-performance dimension is positively correlated with participants’ sex (female) and school grade, and negatively

with academic performance, instrument practice and degree of preference for the instrument played. Time of music learning was not associated with MPA.

Table 2 - Exploratory correlational analysis

Dimensions	1	2	3	4	5	6	7	8	9	10	11	12	13
1.MPA-Cognitive/somatic [†]	1												
2.MPA-Performance [†]	.59**	1											
3.MPA-Total [†]	.96**	.80**	1										
4. Emotional and Behavioural Problems [†]	.57**	.46**	.59**	1									
5. Socially Prescribed Perfectionism [†]	.23**	.27**	.27**	.39**	1								
6. Self-oriented Perfectionism [†]	.27**	-.01	.20*	.17*	.28**	1							
7. Music Self-Efficacy [†]	-.41**	-.62**	-.53**	-.53**	-.29**	.08	1						

8. Sex ^{††}	.40**	.19*	.37**	.34**	.12	.23**	-.23**	1					
9. School grade ^{†††}	.04	.25**	.13	-.01	-.05	-.06	-.03	-.02	1				
10. Academic performance in instrument [†]	.00	-.30**	-.11	-.10	-.06	.29**	.31**	.06	-.22**	1			
11. Instrument practice (time per week) [†]	-.01	-.25**	-.10	-.02	.05	.22**	.16	.05	-.35**	.19*	1		
12. Degree of preference for the instrument ^{†††}	.02	-.39**	-.14	-.14	-.07	.31**	.43**	.20*	-.28**	.57**	.37**	1	
13. Time of music learning [†]	.03	.15	.07	-.07	.11	.01	.06	.10	.32**	-.07	-.22**	-.01	1

* $p < .05$; ** $p < .001$; [†] Pearson correlation; ^{††} point-biserial correlation (0=male; 1=female); ^{†††} Spearman correlation

Predictors of Music Performance Anxiety

Considering the results from the exploratory correlational analysis, predictors of MPA were examined separately for the Cognitive-somatic and Performance dimensions, and time of music learning was excluded. The multiple regression analysis tested three models: Model 1- sociodemographic variables (participants' sex and school grade); Model 2 - music-related variables (instrument academic performance, instrument practice,

time of music learning, and degree of preference for the instrument played); Model 3 - psychological variables (music self-efficacy, emotional and behavioural problems, and perfectionism).

Predictors of MPA-Cognitive/somatic dimension

The multicollinearity assumption is verified – all VID < 1.86. The three regression models are significant, $F(2, 129) = 12.580$, $p < .001$, $R^2_{adj} = .152$ (Model 1), $F(5, 129) = 5.087$, $p < .001$, $R^2_{adj} = .309$ (Model 2), $F(9, 129) = 7.411$, $p < .001$, $R^2_{adj} = .309$ (Model 3).

In model 1, explaining 15% of the variance, only sex was a significant predictor of cognitive-somatic MPA ($b = 10.57$, $SE = 2.14$, $B = .40$, $t = 4.95$, $p < .001$). Model 2 explains 14% of the variance, with sex remaining the only significant predictor ($b = 10.81$, $SE = 2.19$, $B = .41$, $t = 4.93$, $p < .001$).

Model 3 explains 31% of the variance. In this model, where psychological variables were added to the sociodemographic and music-related variables, being female, having higher levels of emotional and behavioural problems and lower levels of music self-efficacy predict higher levels of cognitive-somatic MPA ($b = 5.08$, $SE = 2.19$, $B = 0.19$, $t = 2.32$, $p = 0.02$; $b = 0.18$, $SE = 0.05$, $B = 0.33$, $t = 3.61$, $p < .001$; $b = -2.27$, $SE = 0.12$, $B = -0.23$, $t = -2.34$, $p = 0.02$, respectively). The remaining predictors were not significant, all $b < 1.25$, all $p > .09$.

Table 3 - Multiple Linear Regression of predictors of Cognitive-somatic MPA

	Unstan- dardized β	p	F change	R^2	Adjusted R^2
Model 1					
			12.58	.165	.152
(Constant)	29.129	<.001			
Sex	10.567	<.001			
School grade	1.198	.352			
Model 2					
			.242	.170	.137
(Constant)	35.528	<.001			
Sex	10.812	<.001			
School grade	.902	.525			
Academic performance in instrument	-.710	.709			

Degree of preference for the instrument	-.783	.604			
Instrument practice (time per week)	.123	.772			
Model 3					
			8.73	.357	.309
(Constant)	23.967	.022			
Sex	5.078	.022			
School grade	1.245	.333			
Academic performance in instrument	-.171	.292			
Degree of preference for the instrument	1.224	.403			
Instrument practice (time per week)	.014	.971			
Emotional and behavioural problems	.176	<.001			
Socially prescribed perfectionism	-.145	.501			
Self-oriented perfectionism	.533	.093			
Music self-efficacy	-.271	.021			

Predictors of MPA- Performance dimension

The multicollinearity assumption is verified – all VID < 1.86. The three regression models are significant, $F(2, 129) = 6.967$, $p = .001$, $R^2 \text{ adj} = .085$ (Model 1), $F(5, 129) = 9.977$, $p < .001$, $R^2 \text{ adj} = .258$ (Model 2), $F(9, 129) = 12.634$, $p < .001$, $R^2 \text{ adj} = .448$ (Model 3).

In model 1, explaining 9% of the variance, sex and school grade were significant predictors of performance MPA ($b = 2.35$, $SE = 1.10$, $B = .18$, $t = 2.14$, $p = .035$; $b = 2.05$, $SE = .66$, $B = .26$, $t = 3.11$, $p = .002$, respectively). Model 2 explains 26% of the variance, with sex, academic performance in instrument, and degree of preference for the instrument were significant predictors ($b = 3.16$, $SE = 1.01$, $B = .24$, $t = 3.14$, $p = .002$; $b = -2.06$, $SE = .87$, $B = -.21$, $t = -2.36$, $p = .02$; $b = -2.18$, $SE = .69$, $B = -.30$, $t = -3.15$, $p = .002$, respectively).

Model 3 explains 45% of the variance. In this model, where psychological variables were added to the sociodemographic and music-related variables, only lower levels of music self-efficacy predict higher levels of performance MPA ($b = -.25$, $SE = .05$, $B = -.43$, $t = -4.81$, $p < .001$). The remaining predictors were not significant, all $b < 1.31$, all $p > .06$.

Table 4 - Multiple Linear Regression of predictors of Performance MPA

	Unstan- dardized β	p	F change	R^2	Adjusted R^2
Model 1					
			6.967	.099	.085
(Constant)	10.562	<.001			
Sex	2.352	.035			
School grade	2.052	.002			
Model 2			10.898	.287	.258
(Constant)	31.530	<.001			
Sex	3.162	.002			
School grade	.694	.288			
Academic performance in instrument	-2.056	.020			
Degree of preference for the instrument	-2.176	.002			
Instrument practice (time per week)	-.156	.424			
Model 3					
			11.665	.487	.448
(Constant)	32.004	<.001			
Sex	.629	.519			
School grade	1.073	.061			
Academic performance in instrument	-1.308	.093			

Degree of preference for the instrument	-.646	.320
Instrument practice (time per week)	-.146	.393
Emotional and behavioural problems	.034	.113
Socially prescribed perfectionism	.089	.353
Self-oriented perfectionism	.015	.915
Music self-efficacy	-.247	<.001

Discussion

The main goal of the present study was to examine sociodemographic, music-related, and psychological predictors of music performance anxiety in adolescent music students.

Previously, the factor structure of the MPAI-A in the Portuguese context was tested through confirmatory factor analysis, as suggested by a previous study (Dias *et al.* 2022), to ensure the construct validity of the measure used to study the predictive factors of MPA. Results confirmed the bifactorial structure of the MPAI-A suggested by the exploratory factor analysis: cognitive/somatic and performance dimensions (Dias *et al.* 2022). Although the original version of the instrument included three dimensions (cognitive and somatic features; performance evaluation; and performance context) (Osborne & Kenny 2005), the Portuguese version does not discriminate two separate dimensions related to the performance features. This bifactorial structure seems to relate to differences in the experience of MPA. Thus, the study of the predictors was carried out considering each one of these dimensions.

Each of the dimensions of MPA presented distinct associations with sociodemographic, music-related, and psychological variables assessed. From the music-related variables, the time of music learning was not associated with MPA. This finding is consistent with the results of a recent study, where the age of the start of musical studies was not correlated with MPA, in a sample of music students aged between 15 and 68 years old (Lupiañez *et al.*, 2022). Cognitive-somatic dimension of MPA is associated with all the psychological variables assessed (Emotional and Behavioural Problems, Self-oriented and Socially-prescribed Perfectionism, and Music Self-efficacy) and only one sociodemographic variable (participants' sex). On the other hand, the Performance dimension of MPA is associated with all sociodemographic variables, all psychological variables – except self-oriented perfectionism, and all music-related variables – except time of music learning.

Based on the results of the preliminary correlational analyses, separate regression analyses were conducted for each of the dimensions of MPA including, as predictors, the significantly associated sociodemographic, music-related, and psychological variables.

Cognitive-somatic MPA was predicted by participants' sex (female), higher levels of emotional and behavioural problems, and lower levels of music self-efficacy. Female musicians and music students have been identified, by most previous research, as presenting higher levels of MPA, when compared to male musicians and students (e.g., Fernholz *et al.*, 2019; Lupiañez *et al.*, 2022; Thomas & Nettelbeck 2014; Vaag *et al.*, 2016). Regarding emotional and behavioural problems, as a sign of generalized psychological vulnerability, results from the present study expand previous literature, mostly focused on the association between anxiety or other internalizing problems and MPA (e.g., Lupiañez *et al.*, 2022; Thomas & Nettelbeck 2014). Results suggest that students who present a generalized psychological vulnerability are more prone to experience cognitive and somatic symptoms of MPA.

The performance dimension of MPA was only predicted by lower levels of music self-efficacy. This variable is the only predictor of both cognitive and somatic, and performance dimensions of MPA. In general, these results are consistent with previous research (González *et al.*. 2018; Papageorgi 2022), where low self-efficacy was a predictor of MPA. As suggested by Lupiañez *et al.*. (2022), in a recent study of the predictors of MPA, music achievement motivation is determined by complex interactions between contextual variables and cognitions. In the present study, we have focused on self-efficacy, a specific motivational cognition, and the results reinforce the importance of adaptative and positive beliefs regarding one's ability to perform well as a potential protective factor regarding MPA.

In the present study, perfectionism did not have a predictive role in MPA, unlike other studies' results (e.g., Dobos, *et al.*. 2019; Papageorgi 2022; Patston & Osborne 2016), although some of the previous studies were conducted with older musicians and music students (Dobos, *et al.*. 2019; Papageorgi 2022). Even though results from the current study show that perfectionism, in this sample of young adolescents, is positively correlated with MPA, this association is weak but could become strong enough to play a predictive role in older ages.

In addition, music-related variables did not predict cognitive and somatic MPA. From the list of music-related variables, only the level of preference for the instrument and academic achievement were significant predictors of the performance dimension of MPA but lost their predictive power regarding this dimension when psychological variables were included in the model. This result suggests that psychological dimensions, in particular, music self-efficacy and the level of emotional and behavioral problems tend to play a central role in MPA in this age group.

Conclusions

This study expanded previous literature regarding the predictors of MPA in adolescent music students, by examining,

separately, the cognitive-somatic and performance dimensions, allowing a deeper understanding of the specific factors explaining these two components of MPA. Another strength of the present study is the focus on a critical stage of musicians' development and education. Adolescence is characterized by multiple cognitive, social, and emotional changes, as well as educational challenges. The presence of high levels of MPA, in this stage, is particularly relevant, considering that it could significantly impact students' psychological well-being, and consequently their vocational decisions regarding a musical career. Furthermore, the inclusion of a general psychological vulnerability predictor of MPA also contributes to a clearer analysis of the relationship between MPA and other emotional and behavioral problems. Finally, the present study included a specific motivational variable – music self-efficacy – which can help clarify the role of the complex motivational dimensions, as suggested in a recent study of predictors of MPA (Lupiañez, *et al.*, 2022).

Future research should include contextual variables (e.g., parental involvement and pedagogical relationship) and more music-related individual variables (e.g., instrument played, music genre, for how long participants study music). The inclusion of these variables can allow testing more complex hypotheses, based on mediation or moderation relations between different predictors.

The results of the present study suggest several pedagogical implications, considering the central role of teachers in the management of students' MPA. First, it is important to ensure that music teachers have sufficient and deep knowledge regarding the psychological mechanisms that underly MPA. Both initial and continuous training of music teachers should include contents related to cognitive and emotional development and mental health literacy, specifically related to MPA. Second, consistent with this first proposal, teachers should adopt pedagogical strategies that balance support and autonomy, which could reinforce adaptive motivational cognitions related to self-efficacy, self-control, and competency. Third, taking into consideration the multi-tiered

systems of support approach (Rogers 2019), as in other school settings, music education schools should invest in whole-school strategies to promote psychological well-being through social and emotional learning. Fourth, early intervention strategies focused on groups of students presenting a higher vulnerability for MPA should be implemented, to prevent the exacerbation of this problem. For example, this could be achieved through the implementation empirically-supported psychological group interventions with students showing increased MPA levels. Finally, when severe levels of MPA are identified, a collaborative approach between school, family, and school counselors should be reinforced, allowing the implementation of individual interventions (e.g., cognitive-behavioral therapy) focused on the development of coping strategies that could help such students become more resilient, increase their general level of well-being, and avoid music school dropout.

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PD: Conceptualization, Data curation, Formal analysis, Methodology, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. LV: Conceptualization, Formal analysis, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. IS: Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing.

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