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Spanish Version of the Kenny-Music Performance Anxiety Inventory (K-MPAI): Factorial Structure and First Statistical Analyses of a Peruvian Sample

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ABSTRACT

This study estimated validity evidence based on internal structure, and reliability evidence for scores derived from the intended uses of the Spanish Kenny-Music Performance Anxiety Inventory (K-MPAI). It also provided the first statistical analyses of a Peruvian sample of 455 music students (mean-age = 21.19, *SD* = 3.13). A high-order exploratory factor analysis with Schmid-Leiman solution was performed on the K-MPAI items. One high-order factor (ordinal alpha $\alpha = .97$) and two first order factors (ordinal alpha $\alpha = .93$; $\alpha = .92$) were obtained, explaining 58.65% of shared variance. A significant effect was found for gender differences, but not for musical institutions or genre. A high-order factor called "negative affectivity in relation to music performance anxiety" and two first-order factors labelled "music performance anxiety" and "depressive components" were proposed. Gender-related score differences for MPA and the lack of significant differences in MPA scores between musical genre or musical institution were partially consistent with previous literature.

I. INTRODUCTION

According to Kenny (2011), music performance anxiety (MPA) is characterized by an apprehensive and persistent anxiety towards musical performance, especially in situations where one is being scrutinized by others and where there is a fear of failing (Kenny, 2011). It originates in the confluence of "underlying biological and/or psychological vulnerabilities and/or specific anxiety-conditioning experience" (p. 61). MPA can be experienced by musicians at any point in their professional life, and it is partially independent of their age, accomplishment level, amount of practice, etc. (Chang-Arana, 2016; Kenny, 2011; Ortiz, 2011a, 2011b; Yoshie, Kudo, & Ohtsuki, 2008). However, although widely experienced by musicians (Fishbein & Middlestadt, 1988), adequate levels of MPA can result in a facilitated performance, caused by an increase in concentration and attention (Martínez & Paterna, 2010; Papageorgi, Creech, & Welch, 2011).

Nevertheless, increased levels of MPA which surpass the individuals' adaptive coping levels can have potentially detrimental effects on the professional life and health of musicians. For instance, threats include drugs consumption (legal, illegal and non-prescribed), impaired performances, and even abandonment of the profession (Kenny, 2011; Ortiz, 2011a; Taylor & Wasley, 2004; West, 2004). Recently, Peru has experienced an increase in higher music education programs and youth professional orchestras, raising the chances for people to become musicians and experience MPA. Nevertheless, its systematic study was until recently in its infancy in Peru due to a lack of solid psychological measurement tools. Therefore, one of the main priorities was to explore the underlying structure of the Kenny Music Performance Anxiety Inventory (K-MPAI, Kenny, 2009) for two reasons: to identify the specific behavior of MPA in a Peruvian sample; and to assess whether the theorized structure by Kenny (2009; 2011) resembled the Peruvian sample.

Chang-Arana (2015a, 2015b) adapted the K-MPAI to the Peruvian context and estimated its psychometric properties in a large sample of tertiary music students from three major music institutions. Later, the same author (Chang-Arana, 2016) reported the first statistical analysis of the Peruvian sample. Nevertheless, the results of those research experiences are partially unpublished and available only in Spanish, raising the need to communicate these findings to wider audiences. Consequently, this paper is based upon sections from previous Chang-Arana's works (2015a, 2015b, 2016).

II. AIMS

Estimate validity evidence based on internal structure and reliability evidences for scores derived from the intended uses of the Spanish K-MPAI (Chang-Arana, 2015b; Kenny, 2009).

Provide the first statistical analyses of a Peruvian sample (Chang-Arana, 2016).

III. METHOD

After translating the K-MPAI to Spanish through a back-translation process (Brislin, 1986), the author of the inventory recognized it as the official Spanish version (D. T. Kenny, personal communication, October 16, 2013). Through a convenience sample, 455 tertiary Peruvian music students (mean-age = 21.19, *SD* = 3.13) were group-surveyed with the Spanish version of the K-MPAI. Consent forms and response instructions were read aloud, clarifying any possible doubt from participants.

A high-order exploratory factor analysis (HOEFA) with Schmid-Leiman-solution (SLS, Schmid & Leiman, 1957) was performed on the scored items of 455 tertiary Peruvian music students from three music faculties. Reliability was estimated through ordinal alpha, due to the polychoric nature (i.e. Likert scale) of the items (Bonanomi, Ruscone, & Osmetti, 2013; Gadermann, Guhn, & Zumbo, 2012; Zumbo, Gadermann, & Zeisser, 2007).

Differences in MPA scores for gender, musical genres and musical institutions were tested with *t*-test and one-way-ANOVA, respectively.

HOEFA and reliability values were calculated using Factor 9.3.1 (Lorenzo-Seva & Ferrando, 2015). Additional data analyses were calculated in SPSS 21. Effect sizes were interpreted according to Ellis (2010) and statistical power was interpreted according to Cohen (1992).

IV. RESULTS

A. High-Order Exploratory Factor Analysis

The extraction method selected for the HOEFA was Minimum Rank Factor Analysis (MRFA). After this step, an oblique promin rotation was selected given the theoretical dependence of first order factors towards the high order factor. When deciding about what kind of correlation matrix to factorize, a polychoric correlation matrix was chosen since a Likert scale (polychoric scale) was used to collect the answers from ordinal variables (Burga, 2006). In order to ease the interpretation of the factorial matrix, an orthogonal correction was performed through SLS, thus allowing an easier interpretation of factorial loadings from every item towards the first and second order factors. Minimum Average Partial (MAP) method was selected to determine the amount of factors to retain. Finally, items with factorial loadings equal or higher than .30 were retained (Wolff & Preising, 2005).

The initial conditions for performing the HOEFA were adequate, Kaiser-Meyer-Olkin (KMO) = .91, $\chi^2(780) = 6390.8$, $p < .001$. Factor extraction was repeated until a stable structure was obtained still presenting adequate values for the KMO and Bartlett's sphericity tests, KMO = .93, $\chi^2(435) = 4948.9$, $p < .001$. One high-order factor (G) and two first order factors (F1, F2) were obtained, explaining 58.65% of shared variance (see Table 1). Large effect correlations were obtained between G and F1, $r = .73$; and G and F2, $r = .91$. Ordinal alpha levels and standard error measurement were subsequently calculated and are presented in Table 2.

Table 2. Ordinal alpha and SEM for K-MPAI high and low level factors.

Factors	Ordinal α	SEM
G (30 items)	.97	4.87
F1 (21 items)	.93	6.11
F2 (10 items)	.92	3.01

Note: G = high-order factor; F1 = first first-order factor; F2 = second first-order factor. Item 14 loaded for both F1 and F2.

B. MPA differences According to Gender, Musical Genre and Musical Institution

Descriptive statistics and Shapiro-Wilk normality tests were calculated for MPA scores according to gender, musical genre and musical institution (see Table 3). Evidences of proceeding from a normally distributed population were obtained. Even though musical institution A violated the normality assumption, it was assumed as normally distributed, basing this claim on the central limit theorem (Field, 2009).

A medium effect was found for gender, $t(448) = -4.83$, $p < .001$, $d = .50$, $1 - \beta = .81$; but not for musical genre, $t(442) = 0.03$, $p = .98$, $d = .003$, $1 - \beta = .05$; or musical institution, $F(2, 452) = 1.42$, $p = .24$, $\eta^2 = .006$, $1 - \beta = .30$.

Table 3. Descriptive statistics and Shapiro-Wilk normality test for MPA scores according to gender, musical genre and institution.

Variables	*M*	*SD*	*n*	*S-W*	*df*	*p*
Gender						
Male	67.57	27.52	337	0.99	337	.11
Female	82.53	31.14	113	0.99	113	.76
Musical Genre						
Classical	71.68	29.71	161	0.99	161	.43
Modern	71.60	29.19	283	0.99	283	.22
Musical Institution						
A	71.34	29.31	230	0.99	230	.03*
B	75.93	26.54	84	0.98	84	.37
C	69.19	30.18	141	0.99	141	.57

Note: Adapted from "Music Performance Anxiety in Peruvian Music Students: Differences According to Gender, Educational Institution and Musical Genre," by A. M. Chang-Arana, *Persona, 19*.

*$p < .05$.

V. CONCLUSION

The aim of this paper was two-fold. First, to estimate validity evidence based on internal structure and reliability evidences for scores derived from the intended uses of the Spanish K-MPAI (Chang-Arana, 2015b; Kenny, 2009). A high-order factor called "negative affectivity in relation to music performance anxiety" and two first-order factors named "music performance anxiety" and "depressive components" were proposed, resembling the tripartite model of anxiety and depression (Anderson & Hope, 2008; Clark & Watson, 1991) and Kenny's typology of MPA (2011).

Second, the first statistical analyses of a Peruvian sample were provided (Chang-Arana, 2016). On the one hand, higher levels of MPA detected in female participants may coincide with previous biological and cultural explanations, particularly with gender-based raising patterns (Branney & White, 2008; Olatunji & Wolitzky-Taylor, 2009; Robson & Kenny, 2017; Winkler, Pjrek & Kasper, 2006). On the other hand, no significant differences were found in MPA scores according to the musical genre of specialty (Kenny, 2011). However, alternative results can be found in the literature. For instance, Papageorgi et al. (2011) reported significantly higher MPA levels in Western classical musicians when compared to Scottish traditional or jazz musicians. These differences were found when surveyed right before a solo performance context. Future research could use the K-MPAI to study how musicians from different genres experience MPA, according to performance context (e.g. solo or group) and proximity of performance (e.g. before or after a performance).

Lastly, despite the existence of differences in MPA levels according to gender or musical genre, the importance of this research field still stands. MPA can have detrimental effects on the life of musicians at several levels, and interventions should be planned in order to protect them. Nevertheless, one of the requirements to achieve this goal is to count with solid psychological measurement instruments. This research has been an empirical effort in that direction.

Table 1. HOEFA of the K-MPAI items in a Peruvian sample.

Items	Music Performance Anxiety (F1)	Depressive Components (F2)	Negative Affectivity in Relation to Music Performance Anxiety (G)
10. Prior to, or during a performance, I get feelings akin to panic	.479		.527
11. I never know before a concert whether I will perform well	.264		.644
12. Prior to, or during a performance, I experience dry mouth	.335		.456
15. Thinking about the evaluation I may get interferes with my performance	.385		.463
16. Prior to, or during a performance, I feel sick or faint or have a churning in my stomach	.286		.544
17. Even in the most stressful performance situations, I am confident that I will perform well	.165		.427
18. I am often concerned about a negative reaction from the instructor or listener/audience	.396		.342
19. Sometimes I feel anxious for no particular reason	.274		.457
20. From early in my music studies, I remember being anxious about performing	.566		.363
21.I worry that one bad performance may ruin my career	.405		.381
24. I give up worthwhile performance opportunities	.193		.476
26. My worry and nervousness about my performance interferes with my focus and concentration	.496		.516
28. I often prepare for a concert with a sense of dread and impending disaster	.269		.676
29. One or both of my parents were overly anxious	.227		.407
30. Prior to, or during a performance, I have increased muscle tension	.423		.507
32. After the performance, I replay it in my mind over and over	.331		.350
34. I worry so much before a performance, I cannot sleep	.463		.473
36. Prior to, or during a performance, I experience shaking or trembling or tremor	.516		.483
38. I am concerned about being scrutinized by others	.535		.483
39. I am concerned about my own judgement of how I will perform	.406		.329
14. During a performance I find myself thinking about whether I'll even get through it	.185	.185	.618
1. I generally feel in control of my life		.233	.494
3. Sometimes I feel depressed without knowing why		.251	.569
4. I often find it difficult to work up the energy to do things		.216	.490
5. Excessive worrying is a characteristic of my family		.203	.456
6. I often feel that life has not much to offer me		.403	.613
7. Even if I work hard in preparation for a performance, I am likely to make mistakes		.171	.494
13. I often feel that I am not worth much as a person		.413	.714
27. As a child, I often felt sad		.257	.493
31. I often feel that I have nothing to look forward to		.308	.646

Note: N = 455. Extraction method: Minimum Rank Factor Analysis (MRFA).Method used for estimating advised number of dimensions to retain: Minimum Average Partial (MAP).

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