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Joanna Kantor-Martynuska*
Dianna T. Kenny**

Psychometric properties of the *Kenny-Music Performance Anxiety Inventory* modified for general performance anxiety

Abstract: The main objective of this study was to analyse the psychometric properties of the Polish adaptation of the *Kenny Music Performance Anxiety Inventory – Revised (K-MPAI-R, Kenny, 2009)* modified as the *Kenny Performance Anxiety Inventory (K-PAI)* for a general population of individuals with experience in public performance in fields other than music. Another aim was to test the factor structure of K-PAI on a Polish sample. We analysed the relationship between the scores on K-PAI and general anxiety, depression, attentional control, the scores on the *Behavioural Inhibition Scale (BIS)* and the *Behavioural Activation Scale (BAS)* and reward susceptibility. Participants ($N = 586$) completed the questionnaires in a wider online study. The scores on K-PAI revealed a moderate to strong positive association with different measures of anxiety, trait-anxiety in particular, and negative associations with attentional control and susceptibility to reward. K-PAI scores were strongly associated with depression, but displayed no relationship with the BAS or any of its sub-dimensions. These results generally replicated those obtained on the K-MPAI-R with Australian and Peruvian musicians, indicating the cross-cultural validity of the K-MPAI-R and K-PAI. It is suggested that performance anxiety develops on the basis of the biological predispositions and early negative experiences in performance contexts.

Keywords: Performance anxiety, *Kenny Music Performance Anxiety Inventory-Revised*, scale adaptation, cross-cultural validation

Introduction

Public performance is a chance to demonstrate one's competence but also exposes the performer to others' evaluative responses and the risk of being judged negatively (Kenny, 2011). A wide range of public performance situations may induce performance anxiety, defined as the "experience of persisting, distressful apprehension and/or actual impairment of performance skills in public context" (Salmon, 1990, p. 3). It is associated with personal and social consequences such as a loss of self-esteem and/or professional failure. An ability to deliver public performances successfully, highly valued in the educational, professional, artistic, sporting, and social environment, is often overlaid with stress, which makes performance anxiety a common experience.

A recent definition of performance anxiety classifies it as a "performance only" subtype of social anxiety disorder, in which anxiety is restricted to performance situations (APA, 2013; Hook & Valentiner, 2002). Earlier categorized as social phobia (APA, 1994), performance anxiety has a phobic quality: low genetic component, stronger psychophysical response to performance situations, and lack of relationship to such personality characteristics as shyness or behavioral inhibition (Bögels et al., 2010). An ability to give a public talk, take the floor in a discussion, or deliver any kind of artistic performance is highly valued in the educational, professional, and social environment. However, it is often accompanied with high levels of anxiety, whether in music, sports, dance, test-taking, or other domains of public performance (e.g., Hackfort & Spielberger, 1988; Kenny, 2011; Sarason & Sarason, 2013; Smith & Smoll, 2013).

* Institute of Psychology, Polish Academy of Sciences

** The University of Sydney, Australia

Corresponding author: Joanna Kantor-Martynuska, e-mail: jkantor@psych.pan.pl; Dianna T. Kenny, e-mail: dianna.kenny@sydney.edu.au

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Musicians as a professional group are intensely exposed to the risks of performing in public. Thus, music performance anxiety has been extensively studied over the last decades (for a review, see Kenny, 2011). Music performance anxiety may involve affect, cognition, behaviour, physiological responses, and hormonal imbalances (Steptoe, 2001). The core of music performance anxiety is the fear of the evaluative nature of the performance situation and its possible consequences such as being scrutinized and negatively evaluated. Even though some physiological arousal may be beneficial for the quality of performance (positive effects of performance anxiety were found in nearly 40% of musicians; Kępińska-Welbel, 1997), if its intensity exceeds the optimum and a performer perceives it as negative, the quality of performance may be adversely affected (Kokotsaki & Davidson, 2003; Steptoe, 1998, 2001). Repeated experiences of performance anxiety may result in increased tension and apprehensive cognitions or decreased perceived self-efficacy and one’s value as a performing artist. The most salient negative effects of performance anxiety on the quality of public performance were reported in the context of auditions (Kenny, Driscoll, & Ackermann, 2014).

Music performance anxiety is most often measured with self-report questionnaires that address a relatively stable tendency to experience anxiety in the performance setting. Psychophysiological studies reveal individual differences in arousal and anxiety before, during, and after private and public performances (Studer, Danuser, Wild, Hildebrandt, & Gomez, 2014). Feelings of uncontrollability and helplessness that accompany anxiety may activate the behavioural inhibition and corticotropin secretion systems (Barlow, Chorpita, & Turovsky, 1998; Gray & McNaughton, 1996; Sullivan, Kent, & Coplan, 2000). Performance anxiety seems to be more reliably predicted on the basis of self-report concerning affect and cognition than with measures of autonomic physiological arousal that show wide variability in anxious individuals.

Giving a public performance is associated with exposure to judgment and responsibility for the performance outcome. From the adaptive perspective, anxiety signals a potentially dangerous situation. The Behavioural Inhibition System (BIS) which regulates avoidance motivation is activated when a situation “justifies” avoidance of an impending threatening event, such as giving a public performance. The Behavioural Activation System (BAS) which regulates approach motivation is activated when an individual is involved in a situation associated with a potential reward (Corr, 2008). Here, performing in public may be a chance to show one’s skills and gain applause. BIS and BAS may represent opposing motivations that occur in public performance contexts. As high BIS sensitivity individuals experience high levels of stress in a performance context (Heponiemi, Keltikangas-Järvinen, Puttonen, & Ravaja, 2003), it would be reasonable to expect that the score on any performance anxiety scale will be positively associated with the score on the BIS and negatively associated with the score on the BAS.

In attentional control theory (Eysenck, Derakshan, Santos, & Calvo, 2007), anxiety is understood as an

overload of working memory with associated threat-related cues and apprehensive thoughts. Anxiety impairs the functions of the central executive, a limited-capacity component of working memory which monitors and coordinates information processing (see Baddeley, 1986, 2001) and provides “an interface between perception, attention, memory, and action” (Baddeley, 1996). Anxiety reduces the efficiency of the goal-directed system thereby decreasing the quality of performance. It would be interesting to test whether attentional control is thus weaker in individuals who report high performance anxiety levels.

Considering the interest in empirical research on performance anxiety in Poland (see Kaleńska-Rodzaj, 2018; Kępińska-Welbel, 1997; Tokarz & Kaleńska, 2005) and a need to use the research tools available worldwide and tested with culturally varied populations (e.g., Chang-Arana, Kenny, & Burga-León, 2018) we conducted a study of the Polish version of the *Kenny Music Performance Anxiety Inventory – Revised* (K-MPAI-R). This questionnaire was chosen because it integrates cognitive, emotional and physiological aspects of music performance anxiety. In the K-MPAI-R, special attention is paid to a general psychological vulnerability that underlies most psychopathology, but in particular, other performance anxieties.

As performance anxiety is not confined to the population of musicians, we extended the research beyond musician samples to persons with experience in performing in public. Therefore, the self-report measure of performance anxiety used in this study (K-MPAI-R) was slightly modified to allow measurement of proneness to stress and anxiety related to performing in public in a variety of contexts. K-MPAI-R is based on the triple-vulnerabilities developmental model of anxiety. This model proposes that anxiety is a cognitive-affective structure in the defensive-motivational system (Barlow, 2000). Its core is an individual’s perceived uncontrollability and unpredictability regarding potential future threats and anxious apprehension that result in a sense of helplessness. The three basic components of anxiety include a generalized biological vulnerability, a generalized psychological vulnerability, and a specific psychological vulnerability (Barlow, 2000). Generalized biological vulnerability (exemplary K-MPAI-R item: *One or both of my parents were overly anxious*) as diathesis comprises genetically-based exaggerated responsiveness to stress and is related to negative affect. Anxiety disorders develop if generalized biological vulnerability is “incubated” in early life experiences that result in anxious attachments to primary caregivers which may result in generalized psychological vulnerability (exemplary K-MPAI-R item *I often feel that I am not worth much as a person*). These negative childhood experiences result in the belief that life is unpredictable and uncontrollable. Specific psychological vulnerability (exemplary K-MPAI-R item *I am often concerned about a negative reaction from the audience*) occurs in vulnerable individuals when they are confronted with stresses for which they do

not possess sufficient resources to manage effectively. Specific psychological vulnerability can take many forms, including lack of confidence, fear of evaluation and being scrutinized, catastrophizing, self-criticism, and worry about the outcome of the performance. The presence of all three components increases the risk of developing an anxiety disorder in general and performance anxiety in particular (Kenny, 2009). From another perspective, “internal criticism” rooted in the criticism one has experienced in childhood from significant adults (Rogers, 1951) is reported as the most frequent component of performance anxiety (Montello, 1992, after Gabrielsson, 1999). It may result from strong pressure for achievement in the absence of sufficient support to cope with the accompanying stress (Kenny, 2011).

Considering the structure of K-MPAI-R, Kenny (2011) suggested that there are three subtypes of music performance anxiety, based on specificity and comorbidity of other psychological disorders. She proposed (i) music performance anxiety as a focal anxiety, with no generalized social anxiety, depression or panic; (ii) music performance anxiety that co-occurs with other social anxieties; and (iii) music performance anxiety that co-occurs with panic and depression. This model has been supported by a study on Peruvian and Australian samples (Chang-Arana, et al., 2018). Using a high order exploratory factor analysis (HOEFA) with the Schmid-Leiman solution (SLS), the study revealed a high order structure of music performance anxiety with one high second order factor (G), named “Negative affectivity in relation to music performance anxiety” and two first order factors (“music performance anxiety” and “depression”) for both samples. The results an internal structure of K-MPAI-R pointing to the tripartite typology of music performance anxiety, as mentioned above.

However, soon after the K-MPAI-R had been developed, its structure was tested using exploratory factor analysis on tertiary-level musical students and professional musicians (see Kenny, 2011). These studies revealed that the factor structure of music performance anxiety as measured with K-MPAI-R varied between student and professional musicians, but the underlying components of music performance anxiety in both populations were consistent. The prevailing factors in music conservatory students were: 1) Depression/hopelessness (Psychological vulnerability), 2) Worry/dread (Negative cognitions), 3) Proximal somatic anxiety, 4) Parental empathy, 5) Memory, 6) Pre- and post-performance rumination, 7) Generational transmission of anxiety, 8) Self/other scrutiny, 9) Controllability, 10) Opportunity cost, 11) Trust and 12) Pervasive performance anxiety. These underlying factors were divided into three categories: early relationship context (factors 7 and 4), psychological vulnerability (factors 1, 9, 11, 12), and proximal performance concerns (factors 3, 2, 6, 8, 10 and 5). The factors in professional musicians were: 1) Proximal somatic anxiety and worry about performance, 2) Worry/dread (Negative cognitions/ruminations) focused on self/other scrutiny, 3) Depression/hopelessness (Psychological vulnerability), 4) Parental empathy, 5) Memory, 6) Generational transmission of

anxiety, 7) Anxious apprehension, and 8) Biological vulnerability. The difference in the structure of music performance anxiety can be explained with the highly selected sample of professional musicians. The results provided a complex structure for music performance anxiety comprising six major factors that was shared by these two groups.

In the present study, the three hypothetical components representing the three vulnerabilities recognized in the theory on which the inventory was based (Barlow, 2000; Kenny, 2009, 2011) were additionally taken into account in the analyses. Exploring the psychometric properties of such subscales may help to describe the individual profile of performance anxiety, i.e., the major causes and symptoms in an individual performer, as well as comparing the types of vulnerabilities in different groups of performers.

Hypotheses

Individuals who suffer from performance anxiety may also be diagnosed with social anxiety disorder, panic or panic disorder, and depression (Kenny, Arthey, & Abbass, 2014). Thus, we expected positive relationships between the results on Kenny Performance Anxiety Inventory (K-PAI) and general anxiety, both state and trait, depression, attentional control, and the Behavioural Inhibition System (Corr, 2008). We also hypothesized a negative relationship between K-PAI and the Behavioural Activation System (Corr, 2008).

The statistical analyses were conducted in SPSS 23. We used descriptive statistics, Cronbach’s α as an internal consistency test, discriminative power analysis, convergent and discriminant validity analysis and exploratory factor analysis.

Method

Participants

The Polish sample consisted of 586 participants (307 females; 279 males) with a mean age of $M=38.3$ years ($Md=38$, $SD=13.5$, $Range=18-65$). 50 participants completed the inventory twice in the test-retest procedure. In terms of age, the Polish sample was comparable to the Australian sample of elite orchestral musicians whose mean age was 42.1 years ($SD=10.3$; $Range=18-68$) but more mature than the Peruvian music students sample where participants were mostly young adults with a mean age of 21.19 years ($SD=3.13$, $Range=18-40$ years; Chang-Arana, et al., 2018).

The Polish sample consisted of members of a general population, for the most part non-musicians, with experience in performing in public in a variety of situations. Most of them had an experience of speaking in public, e.g., giving a talk, taking part in a discussion or giving their opinion unprepared during an interview or an exam (see Table 1). Between 6 to 8 percent of the sample referred to their performance anxiety in the context of artistic performances.

An additional subsample comprising 47 professional Polish musicians (79.55%) and students of a music

Table 1. Proportion of participants with experience in performing in specific performance situations

	no	yes	% of sample
Giving a talk	382	204	35
Unprepared speech	364	222	38
Discussion	249	337	57
Theatre	552	34	6
Music	539	47	8
Radio/TV	545	41	7
Interview	412	174	30
Sports	419	167	28
Exam	435	151	26

conservatory (20.45%) – 22 female (four participants did not declare their sex) – aged 22–55 years ($M=33.26$, $SD=8.36$) volunteered for the study in which they completed the Polish translation of the original K-MPAI-R. The recruitment criterion was either a degree in a musical instrument from a music conservatory or ongoing studies in the instrumental department of a music conservatory. The subsample consisted of 11 violinists, 8 pianists, 5 cellists, 5 flutists, 2 violists, 2 bassists, 2 clarinetists, and 2 percussionists. There were also one each of oboe, organ, accordion, horn and trumpet players. Five musicians did not specify their instrument. All the participants were members of Polish or Danish orchestras. They were recruited by means of a snowball sampling technique.

Adaptation procedure

After obtaining the Author’s permission to adapt the K-MPAI-R into the K-PAI for the Polish population, the inventory was translated by two psychologists fluent in English and specialising in music cognition, one of whom was involved in research in music performance anxiety. The translated items were then back translated by a professional translator, and corrected for minor linguistic inadequacies. The back-translated items were discussed with the Author and corrected for the remaining incongruences. In order to make the K-PAI available to investigate performance anxiety in non-musicians, items 11, 20, 28, 35 and 37 were slightly modified in terms of vocabulary: “concert” was replaced by “performance” (items 11 and 28), “in my music studies” was replaced with “during my education” (item 20), “performing without music” was replaced by “performing by heart” (item 35), and “playing” was replaced with “performing” (item 37). The next stage of the adaptation procedure was testing the stability, reliability and theoretical validity of the adapted scale with the use of the questionnaires listed above.

K-PAI, like K-MPAI-R, comprises 40 items. The response form is a 7-step Likert scale, from “I strongly agree” to “I strongly disagree”, where high scores represent higher performance anxiety. In order to provide the

adequacy of K-PAI for a wider population of performers, a few items were slightly modified in terms of the vocabulary used [as described later].

Research procedure and materials

In an online survey, the participants completed the Polish translation of the K-MPAI-R (Kenny, 2009) adjusted for a general population of performers as K-PAI, Anxiety and Depression Questionnaire (ADQ; Fajkowska, Domaradzka, & Wytykowska, 2018) comprising arousal anxiety, apprehension anxiety, anhedonic depression and valence depression scales, the Polish versions of State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970; Spielberger, Strelau, Tysarczyk, & Wrześniewski, 1987), Behavioural Inhibition Scale (BIS), and Behavioural Activation Scale (BAS; Carver & White, 1994; Müller & Wytykowska, 2005) comprising BAS-Activity, BAS Pleasure Seeking, BAS Reward Sensitivity and BIS scales, and Attentional Control Scale (ACS; Derryberry & Reed, 2002; Fajkowska & Derryberry, 2010). Three weeks later, 50 participants completed K-PAI again as a retest.

The three vulnerabilities underlying performance anxiety and forming the theoretical background of the K-PAI were taken into account in the analyses of the psychometric properties of the inventory. While it was not explicit in the original studies (Kenny, 2009; Chang-Arana et al., 2018), we hypothetically assumed that the generalized biological vulnerability (GBV) component comprised items 12, 16, 22, 30 and 36, the generalized psychological vulnerability (GPV) component – items 1, 2, 3, 4, 5, 6, 8, 9, 13, 19, 23, 27, 29, 31, 33 and 38, and the specific psychological vulnerability (SPV) component – items 7, 10, 11, 14, 15, 17, 18, 20, 21, 24, 25, 26, 28, 32, 34, 35, 37, 39 and 40. The items were assigned to specific components of the inventory based on the adequacy of their content to specific vulnerabilities contributing to performance anxiety. Some items – 1, 2, 9, 17, 23, 33, 35, and 37 – were reverse scored to avoid response set. The total score on the inventory represents the intensity of performance anxiety.

Results

Descriptive statistics

The mean total score on K-PAI was high with reference to K-MPAI-R cut offs (Kenny, 2015). There were no significant sex differences in the general score on K-PAI but females scored slightly higher on GBV, $F(1,585)=6.94$, $p<.01$; $\eta^2_p=.01$. Table 2 presents basic descriptive statistics of the total scores on K-PAI and its theory-based K-PAI components.

The total K-PAI score correlated negatively with age, $r(586)=-.27$; $p<.001$. The scores on the subscales revealed a similar relationship with age: GBV, $r(586)=-.28$; $p<.001$, GPV, $r(586)=-.22$; $p<.001$, SPV, $r(664)=-.27$; $p<.001$. Table 3 presents intercorrelations between the K-PAI components.

Table 2. Descriptive statistics for K-PAI (N = 586)

	Maximum score	Minimum	Maximum	Mean	Standard deviation
Total score (n = 40)	280	7	193	101.72	40.04
General biological vulnerability (n = 5)	35	0	29	12.60	6.92
General psychological vulnerability (n = 16)	112	9	84	40.37	14.04
Specific psychological vulnerability (n = 19)	133	0	105	49.59	21.31

Table 3. Intercorrelations between the K-PAI hypothetical subscales: Pearson correlations

N = 586	General psychological vulnerability	Specific psychological vulnerability
General biological vulnerability	.72**	.89**
General psychological vulnerability		.78**

** $p < .01$ **Reliability**

The original K-MPAI-R revealed excellent internal consistency reliability (Cronbach's $\alpha = .94$), and the Polish version of K-PAI represents only slightly lower internal consistency (Cronbach's $\alpha = .89$). Internal consistency of the three hypothetical components in the Polish K-PAI was high or acceptable (GBV Cronbach's $\alpha = .72$, GPV Cronbach's $\alpha = .62$, SPV Cronbach's $\alpha = .85$). The general score on the inventory is an index of performance anxiety, and the scores on the three theory-based components represent their contribution to each individual's performance anxiety profile, emphasizing its somatic or psychological aspects.

Temporal stability was measured using the test-retest procedure. The results of the test-retest procedure on 50

participants revealed high temporal stability of K-PAI results ($r = .86$), which suggests high reliability of K-PAI as a measure of a trait-like tendency to experience anxiety associated with performing in public.

The discriminative power of the individual K-PAI items was calculated as a correlation coefficient of a given item with the total score on the inventory diminished by this item (r_{it} ; see Drwal & Brzozowski, 1995; Ferguson & Takane, 2007; Guilford 1954/2005). Five K-PAI items (2, 9, 23, 33, 35) showed very low consistency with the general score on K-PAI. The remaining items on the Polish version of K-PAI otherwise showed acceptable to high internal consistency (.35–.80) (see Table 4).

Table 4. Indices of discriminative power for the Polish version of K-PAI

K-PAI item	Item discriminative power
1. I generally feel in control of my life	.517
2. I find it easy to trust others	.232
3. Sometimes I feel depressed without knowing why	.614
4. I often find it difficult to work up the energy to do things	.619
5. Excessive worrying is a characteristic of my family	.621
6. I often feel that life has not much to offer me	.642
7. Even if I work hard in preparation for a performance, I am likely to make mistakes	.734
8. I find it difficult to depend on others	.541
9. My parents were mostly responsive to my needs	.033
10. Prior to, or during a performance, I get feelings akin to panic	.772
11. I never know before a performance whether I will perform well	.681
12. Prior to, or during a performance, I experience dry mouth	.716
13. I often feel that I am not worth much as a person	.716

Table 4 cont.

K-PAI item	Item discriminative power
14. During a performance I find myself thinking about whether I'll even get through it	.784
15. Thinking about the evaluation I may get interferes with my performance	.765
16. Prior to, or during a performance, I feel sick or faint or have a churning in my stomach	.741
17. Even in the most stressful performance situations, I am confident that I will perform well	.434
18. I am often concerned about a negative reaction from the audience	.742
19. Sometimes I feel anxious for no particular reason	.705
20. From early in my education, I remember being anxious about performing	.704
21. I worry that one bad performance may ruin my career	.742
22. Prior to, or during a performance, I experience increased heart rate like pounding in my chest	.679
23. My parents almost always listened to me	.213
24. I give up worthwhile performance opportunities	.783
25. After the performance, I worry about whether I played well enough	.686
26. My worry and nervousness about my performance interferes with my focus and concentration	.806
27. As a child, I often felt sad	.553
28. I often prepare for a performance with a sense of dread and impending disaster	.778
29. One or both of my parents were overly anxious	.496
30. Prior to, or during a performance, I have increased muscle tension	.791
31. I often feel that I have nothing to look forward to	.760
32. After the performance, I replay it in my mind over and over	.656
33. My parents encouraged me to try new things	.127
34. I worry so much before a performance, I cannot sleep	.751
35. When performing by heart, my memory is reliable	.119
36. Prior to, or during a performance, I experience shaking or trembling or tremor	.782
37. I am confident performing from memory	.422
38. I am concerned about being scrutinized by others	.745
39. I am concerned about my own judgement of how I will perform	.609
40. I remain committed to performing even though it causes me great anxiety	.350

Validity evidence based on relationships with other variables

Convergent evidence

Convergent validity was demonstrated for the total K-PAI score by significant positive correlations with the scores on STAI-state ($r = .461, p < .01$), STAI-trait ($r = .731, p < .01$), ADQ apprehension anxiety ($r = .548, p < .01$), ADQ arousal anxiety ($r = .508, p < .01$) and BIS ($r = .397, p < .01$), and high negative correlations with ACS ($r = -.525, p < .01$) and RST susceptibility to reward ($r = -.541, p < .01$). K-PAI

scores revealed strong relationships with the measures of the individual differences with which performance anxiety is theoretically associated.

The total scores on K-PAI showed high positive correlation with ADQ anhedonic depression ($r = .659$) and valence depression ($r = .584, p < .01$). Positive correlations were also found between the scores on BDI and the total score on K-PAI ($r = .413, p < .01$), as well as its three theory-based components: GBV ($r = .316, p < .01$), GPV ($r = .471, p < .01$), and SPV ($r = .345, p < .01$). Weak

negative correlations were found between the total score on K-PAI and BAS Activity ($r = -.21, p < .05$) and BAS Pleasure Seeking ($r = -.231, p < .05$) scales.

Discriminant evidence

The general score on K-PAI did not correlate with Reward Seeking ($r = .075$).

Validity evidence based on internal structure

The factor structure of the Polish version of the K-MPAI-R was assessed using a principal axis factor analysis with orthogonal-varimax rotation on the 40 items of the K-PAI. An appropriate Kaiser-Meyer Olkin measure of sampling adequacy (KMO) and a statistically significant Bartlett's test of sphericity were obtained, $KMO = .929, \chi^2(586) = 6352.896, p < .001$. Four orthogonal factors were extracted and retained according to the parallel analysis. Factors were named "Proximal performance dread and worry" (20 items: 10, 11, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 28, 30, 32, 34, 36, 38, 39; Cronbach's $\alpha = .91$), "general psychological vulnerability" (7 items: 4, 3, 6, 5, 8, 13, 31, Cronbach's $\alpha = .90$), "confidence in memory" (2 items, Cronbach's $\alpha = .78$), and "early parental relationship context" (3 items, Cronbach's $\alpha = .71$). The four-factor structure was comparable with the recent study on the Australian and Peruvian samples

of musicians (Chang-Arana et al., advance online publication). This factor structure may be relevant to the results of the sample internally varied as to the type of performance.

As our aim was to determine the relationship between the Polish and other versions of the K-MPAI-R, we replicated the analyses from Chang-Arana et al., (advance online publication). First order exploratory factor analysis with orthogonal-varimax rotation revealed four factors that significantly explained the total result on the K-PAI. Again, their characterization corresponded to those in the original study (Chang-Arana et al., advance online publication): "Proximal performance concern": (20 items: 10, 11, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 28, 30, 32, 34, 36, 38, 39; Cronbach's $\alpha = .97$), "Psychological vulnerabilities" (6 items: 3, 4, 5, 6, 8, 13, Cronbach's $\alpha = .86$), "Early parental relationship context" (3 items: 9, 23, 33; Cronbach's $\alpha = .79$). The minor 2-item factors ("Anxiety and affective vulnerability", Cronbach's $\alpha = .65$; "Trust and control", Cronbach's $\alpha = .56$; "Confidence in memory", Cronbach's $\alpha = .55$) had low response consistency and thus were not taken into account in the comparisons between the original and Polish versions of the inventory. This factor structure may be relevant to the results of the sample internally varied as to the type of performance.

Table 5. Factor structure of K-PAI for the Polish sample of participants with experience in performing in public and professional musicians

K-PAI factor and its respective items	Factor loading
Factor 1. Proximal performance concerns (19 items, alpha = .968)	
10. Prior to, or during a performance, I get feelings akin to panic	.754
11. I never know before a concert whether I will perform well	.678
12. Prior to, or during a performance, I experience dry mouth	.689
14. During a performance I find myself thinking about whether I'll even get through it	.721
15. Thinking about the evaluation I may get interferes with my performance	.773
16. Prior to, or during a performance, I feel sick or faint or have a churning in my stomach	.746
18. I am often concerned about a negative reaction from the audience	.762
20. From early in my education, I remember being anxious about performing	.749
21. I worry that one bad performance may ruin my career	.695
22. Prior to, or during a performance, I experience increased heart rate like pounding in my chest.	.768
24. I give up worthwhile performance opportunities due to anxiety	.701
25. After the performance, I worry about whether I played well enough	.768
26. My worry and nervousness about my performance interferes with my focus and concentration	.806
28. I often prepare for a concert with a sense of dread and impending disaster	.785
30. Prior to, or during a performance, I have increased muscle tension	.790
32. After the performance, I replay it in my mind over and over	.586
34. I worry so much before a performance, I cannot sleep	.772

Table 5 cont.

K-PAI factor and its respective items	Factor loading
36. Prior to, or during a performance, I experience shaking or trembling or tremor	.746
38. I am concerned about being scrutinized by others	.735
39. I am concerned by my own judgment of how I will perform	.605
Factor 2. Psychological vulnerabilities (7 items, alpha = .864)	
3. Sometimes I feel depressed without knowing why	.759
4. I often find it difficult to work up the energy to do things	.767
5. Excessive worrying is a characteristic of my family	.695
6. I often feel that life has not much to offer me	.695
8. I find it difficult to depend on others	.641
13. I often feel that I am not worth much as a person	.630
39. I am concerned about my own judgement of how I will perform	.776
Factor 3. Early parental relationship context (3 items, alpha = .794)	
9. My parents were mostly responsive to my needs	.806
23. My parents always listened to me	.868
33. My parents encouraged me to try new things	.817

On the other hand, when the population of professional musicians was exempt from the sample, first order exploratory factor analysis with orthogonal-varimax rotation issued three factors that provided significant explanation of the total result on the K-PAI. "Proximal

performance concern" (19 items: 26, 15, 10, 22, 34, 30, 18, 28, 14, 38, 11, 20, 16, 12, 32, 21, 24, 36; Cronbach's $\alpha = .97$), "psychological vulnerabilities" (7 items: 3, 4, 5, 6, 8, 13, 39; Cronbach's $\alpha = .86$), "early parental relationship context" (3 items: 9, 23, 33; Cronbach's $\alpha = .79$).

Table 6. Factor structure of K-PAI for the Polish sample of participants with experience in performing in public (musicians excluded)

K-PAI factor and its respective items	Factor loading
Factor 1. Proximal performance concerns (19 items, alpha = .968)	
10. Prior to, or during a performance, I get feelings akin to panic	.754
11. I never know before a concert whether I will perform well	.678
12. Prior to, or during a performance, I experience dry mouth	.689
14. During a performance I find myself thinking about whether I'll even get through it	.721
15. Thinking about the evaluation I may get interferes with my performance	.773
16. Prior to, or during a performance, I feel sick or faint or have a churning in my stomach	.746
18. I am often concerned about a negative reaction from the audience	.762
20. From early in my education, I remember being anxious about performing	.749
21. I worry that one bad performance may ruin my career	.695
22. Prior to, or during a performance, I experience increased heart rate like pounding in my chest.	.768
24. I give up worthwhile performance opportunities due to anxiety	.701
25. After the performance, I worry about whether I played well enough	.768
26. My worry and nervousness about my performance interferes with my focus and concentration	.838

Table 6 cont.

K-PAI factor and its respective items	Factor loading
28. I often prepare for a concert with a sense of dread and impending disaster	.785
30. Prior to, or during a performance, I have increased muscle tension	.790
32. After the performance, I replay it in my mind over and over	.586
34. I worry so much before a performance, I cannot sleep	.772
36. Prior to, or during a performance, I experience shaking or trembling or tremor	.746
38. I am concerned about being scrutinized by others	.735
Factor 2. Psychological vulnerabilities (7 items, alpha = .864)	
3. Sometimes I feel depressed without knowing why	.759
4. I often find it difficult to work up the energy to do things	.767
5. Excessive worrying is a characteristic of my family	.695
6. I often feel that life has not much to offer me	.695
8. I find it difficult to depend on others	.641
13. I often feel that I am not worth much as a person	.630
39. I am concerned about my own judgement of how I will perform	.776
Factor 3. Early parental relationship context (3 items, alpha = .794)	
9. My parents were mostly responsive to my needs	.806
23. My parents always listened to me	.868
33. My parents encouraged me to try new things	.817

When the professional musicians were omitted from the sample, item 39 (*I am concerned about my own judgment of how I will perform*) loaded “Psychological vulnerabilities” factor instead of “Proximal performance concern” factor, as it did in the total sample. Low discriminative power of the K-PAI items regarding performers’ confidence in memory and trust they experience in life suggest these are not major aspects of performance anxiety. Yet, considering the marginal difference between the components distinguished between the samples with and without professional musicians, a more universal character for the structure of performance anxiety obtained for the subsample with professional musicians omitted, the relationship between the hypothesized theoretical components of performance anxiety were as follows (Table 7):

Table 7. Pearson correlations between the hypothesized theoretical and the empirically revealed components of performance anxiety based on the general sample of persons with experience in performing

	GBV	GPV	SPV
Factor 1	.894**	.721**	.921**
Factor 2	.678**	.933**	.743**
Factor 3	.014	.217**	.027

** $p < .01$.

Discussion

The study showed the modified K-MPAI-R (Kenny, 2009), i.e., the K-PAI, to be psychometrically robust in assessing performance anxiety in a general population of Polish individuals who perform in public. The psychometric properties of the Polish version of K-MPAI-R comply with the expectations of external validity. The scores on K-PAI revealed moderate to strong positive associations with anxiety, trait-anxiety in particular, and negative associations with attentional control and susceptibility to reward. Results on K-PAI also showed positive associations with depression measures. These findings support the presumption that a tendency to experience performance anxiety comprises anxiety and depression components (see Kenny, 2011). Individuals with higher proneness to depressed mood seem more at risk of experiencing performance anxiety than individuals who report no mood disturbances. At the same time, the scores on the K-PAI showed the hypothesized inverse relationship with BAS. The study points to a positive association between performance anxiety and negative affect and suggests that performance anxiety and positive affect are orthogonal. These results support the theoretical proposition of a higher explanatory value of pleasant mood – unpleasant mood and arousal – calm dimensions as compared to positive and negative affect whose

mutual independence is hard to demonstrate in empirical research (Green & Salovey, 1999; Tellegen, Watson, & Clark, 1999).

The results of this study are slightly different from those observed for the Australian and Peruvian samples of musicians. In both Australian and Peruvian samples, the hierarchical superiority of the *Negative affectivity in relation to music performance anxiety* over two first order factors – *Music performance anxiety* and *Depression* – was revealed (Chang-Arana et al., 2018). In the present study, three major factors were identified: 1) Tension and apprehension about performing, 2) Depression, and 3) Lack of parental support. The results of the exploratory factor analysis suggest that the core of performance anxiety, as reflected by its major component i.e., 19-item Tension and apprehension about performing, comprises physiological responses, and feelings and thoughts immediately relevant to giving a performance. This primary aspect of performance anxiety merges the biological and specific psychological vulnerabilities distinguished by Barlow (2000) and adapted by Kenny (2009). The general psychological vulnerability reflected in the other two factors refers to general life experience involving low self-esteem, depressed mood, and an individual's relationship with his/her parents. The 6-item Depression factor was of a more general character, unrelated to performing itself. The Lack of parental support factor, comprising three items, again refers to a general experience of a safe and supportive relationship with parents. The 3-factor structure of performance anxiety 1) Proximal performance concern, 2) Psychological vulnerability, 3) Early parental relationship context that the analysis revealed suggests that general psychological vulnerability as background for performance anxiety is internally inconsistent as measured with K-PAI, and only partly relevant for performance anxiety. Performance anxiety may develop on the basis of the biological predispositions merged with early negative experiences in performance contexts.

This may account for the non-replication of the hierarchical structure of performance anxiety in musicians in the sample of individuals with experience in performing in public in a variety of contexts. Negative affectivity in relation to music performance anxiety may be a by-product of music education. The demands of working and long-term memory are immense in music performance (e.g., Palmer, 2006; Williamon, 1999). Musicians would almost certainly be more troubled by memory difficulties than other public performers. Further, most musicians are concerned about memory demands regardless of the severity of their music performance anxiety. Most musicians perform music in a reproductive context that only allows for small variations in interpretation while other forms of public performance leave more leeway for improvisation. This may be one of the reasons why "reliability of memory during a performance" did not appear to significantly load performance anxiety in the current sample.

The inconsistency in the results of the exploratory factor analysis in the culture specific samples may also be the consequence of deeper differences in the experience

of performance anxiety: The items that Chang-Arana et al. (2018) eliminated from the final analysis in both language groups refer to the musicians' relationship with their parents (9, 23, 33) and the reliability of memory during a performance (35, 37; all of which were reverse-scored items). In the present sample, the items 9, 23 and 33 did not significantly contribute to explaining the construct of performance anxiety. These items had high factor loadings on Factor 3, so we retained them even though the responses to these items revealed low correlations with the total score on the scale. The results show that the general trust (35) and memory-related (2) items were not relevant to this factorial model and they may be eliminated from the inventory. In fact, item 35 was also eliminated from the factorial structure of the original version of the K-MPAI-R and its Spanish-language version (Chang-Arana, et al., 2018).

One reason for the above observations may be the reverse response key for these items. The control of balance of items with reference to response key with the aim of preventing response bias implies a risk of losing their content validity. Reverse wording does not necessarily prevent response bias and data may be contaminated by respondents' inattention and/or confusion (Sonderen, Sanderman, & Coyne, 2013). Additionally, the items concerning the experience of parental support may have required a deeper thought to respond to, resulting in the lack of correspondence between these and other items of the inventory. Thus, further work on the inventory is recommended which should include these items worded in the same direction as other items.

It has long been controversial whether positive and negative affect are independent (Crawford & Henry, 2004) and studies that show their slight negative correlation suggest that it may be an effect of time frame, response format, and the grammatical form of the item (Russell & Carroll, 1999). Lack of trust may not be synonymous with experiencing distrust, and experiencing parental support and encouragement may not negatively correspond to an experience of being abandoned or unloved. Our study demonstrated that linguistic negation is not necessarily equal to semantic and functional negation. The resulting weak correspondence between Factors 1 and 3 may not reflect the content but the linguistic aspect of the questionnaire items that load them. Again, it seems that language both provides the means of measuring individual differences and poses limits to the precision of such measurement. Moreover, this study demonstrates that the components of performance anxiety are associated with the content of the components rather than their etiology. Biological or psychological classification of the elements of performance anxiety may be purely conceptual and may not reflect the underlying structure of performance anxiety.

Future studies could address the following questions: Are musicians more stressed than other performers, such as public speakers, dancers or athletes? What is specific about performance anxiety in musicians and other performers? Can we put all these performers into one pool and explore their performance anxiety as a common experience?

Conclusion

The results of the K-PAI adaptation study revealed good psychometric properties in a Polish sample of individuals with experience in giving a wide range of public performances. The Polish adaptation of the K-MPAI designed for use with musicians met the same standards as the original while measuring performance anxiety as applied to other types of public performance.

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