Anxiety in musicians: On and off stage

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Abstract

Music performance anxiety (MPA) is a prevalent problem for musicians. MPA has been conceptualized as a type of social anxiety and also as a discrete focal anxiety with normal functioning outside of specific music performance situations. In an effort to examine unique and overlapping components of MPA and social anxiety, 130 professional musicians were assessed concerning self-reported MPA in three different musical performance settings (solo, group, and practice) using the Performance Anxiety Questionnaire and also completed measures of general social anxiety. Results showed that the expression of MPA varies by performance setting, with the most anxiety reported during solo performances. Regression models demonstrated that general measures of social anxiety increasingly predicted MPA from practice, to group, to solo settings, with fear of negative evaluation uniquely predicting anxiety in all three contexts. These results highlight fear of negative evaluation as a core component of MPA. Based on these findings, the relationship between MPA in various performance contexts and social evaluative anxiety is discussed.

Keywords

fear of negative evaluation, music performance anxiety, musicians, social anxiety, stage fright

Music performance anxiety (MPA), commonly known as stage fright, can create effects ranging from slight impairment to levels that can qualify for a diagnosis of social anxiety disorder (SAD; American Psychiatric Association, 2013). The anxiety may be highly circumscribed to musical performances, or it may occur as part of SAD, in which musical performance is only one of many anxiety-provoking social situations (Kenny, 2011). In a Dutch study, 59% of musicians reported some level of anxiety that interfered with their performance, and 21% reported anxiety at severe levels (van Kemenade, van Son, & van Heesch, 1995). MPA appears to be independent of musical training and accomplishment (Kenny, 2011). The current study was designed to examine musicians' MPA in three different performance settings (solo, group, and

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practice) to provide descriptive data about the influence of setting. Additionally, we examined the association of four measures of social anxiety with MPA in each setting, to determine whether different performance settings activate different aspects of social-evaluative anxiety in musicians.

Music performance anxiety and social anxiety

Currently, according to the Diagnostic and Statistical Manual of Mental Disorders, severe MPA may be diagnosed as SAD (DSM-5; American Psychiatric Association, 2013). SAD is an anxiety disorder manifested by excessive fear and avoidance of one or more situations involving possible scrutiny by others and fears of embarrassment and humiliation. SAD fears involve three main contexts: formal performance (e.g., speaking in public or musical performance), social interaction (e.g., conversing with people at a social event), and being observed while performing routine activities (e.g., writing a check with others present; Bögels et al., 2010). When the fear is restricted to speaking or performing in public, as in MPA, the specifier 'performance only' may be added to a SAD diagnosis. Fear of negative evaluation is a core concern of individuals with SAD across situations (Weeks et al., 2005). For example, a person may fear being evaluated as awkward while at a party, or a speaker may fear being evaluated by the audience as stupid. Similarly, people with MPA may fear negative evaluation specifically during music performance.

In an early study connecting MPA and SAD, Steptoe and Fidler (1987) noted a significant positive correlation between MPA and a fear of crowds and social situations. However, MPA may differ significantly from more generalized forms of SAD. For example, when compared to their counterparts with other forms of SAD, individuals with MPA are less likely to recognize their fear as excessive or irrational (McGinnis & Milling, 2005). Unlike situations in which the fears of negative evaluation are inflated (e.g., urinating in a public restroom), a negative evaluation of a musical performance may be realistic, depending on the context. Music performance ranges from highly exposed solo performances to large group ensemble performances, to practice situations in which the musician is playing alone. These highly varying settings should be considered in the expression of MPA, as one musician may experience it only when performing professionally in front of a large audience, but another may be incapacitated by anxiety even when practicing in the presence of a single listener. The former example would represent MPA that has relatively small overlap with generalized SAD; the latter example would represent significant overlap between the two disorders.

To examine MPA in these various contexts, Cox and Kenardy (1993) investigated social anxiety, measured by the Social Phobia and Anxiety Inventory (SPAI; Turner, Beidel, Dancu, & Stanley, 1989) and its relationship to MPA in three different settings (solo performance, group performance, and practice). The SPAI measures cognitive (e.g., negative thoughts about how one appears to others), somatic (e.g., blushing), and behavioral (e.g., avoidance of eye contact) dimensions of anxiety during social encounters. Social anxiety as measured by the SPAI was only significantly associated with MPA in the solo musical performance setting and did not have a significant relationship with MPA in group or practice settings. Cox and Kenardy's report highlights the importance of setting when examining MPA, suggesting that social fears are particularly activated and problematic when the performer is the sole object of scrutiny.

Osborne and Franklin (2002) also examined MPA and its relation to SAD using Rapee and Heimberg's (1997) cognitive model of SAD as their conceptual framework. This model emphasizes the role of cognitive processes, including attention to social-evaluative cues, perception of the likelihood of negative evaluation from others, and interpretation of symptoms of anxiety. Osborne and Franklin (2002) assessed presumed audience appraisal, perception of audience

standards, estimated likelihood of a negative evaluation, and perceived importance of the consequence of a negative evaluation. In this study, musicians' ratings of the likelihood of a negative evaluation during a performance and the perceived importance of a negative evaluation were the only significant predictors of MPA. Importantly, fear of negative evaluation, assessed with the Brief Fear of Negative Evaluation scale (BFNE; Leary, 1983) was significantly correlated with but not uniquely predictive of MPA (Osborne & Franklin, 2002). These results suggest the importance of delineating specific features of social anxiety in order to understand the relationship between SAD and MPA.

Considering the available research, it is notable that at least some individuals with MPA do not exhibit anxiety in other social situations (Cox & Kenardy, 1993). Kenny (2011) attempted to characterize the relationship between social anxiety and MPA by proposing three different types of MPA. First, MPA could present as a focal, highly circumscribed problem in which musicians have severe anxiety in certain musical performance situations, such as solo or audition settings, but function normally outside of these situations. Second, MPA could be an expression of generalized SAD in which musicians have significant and distressing social anxiety off stage, as well as on stage (see Clark & Agras, 1991; Osborne & Kenny 2005). The third type of MPA is a 'disorder of the self' with performance anxiety resulting from a conditional sense of self-worth that developed in childhood (Kenny, 2011, p. 260). This form of MPA is especially likely to be accompanied by depression, panic attacks, and distressing somatic responses. Although validation of the three types of MPA is outside the scope of this study, this theory suggests that MPA, like social anxiety more broadly, may be a multifaceted construct that warrants investigation in different performance settings.

Overview of the current study

The current study was designed to expand available research on the relationship between MPA and social anxiety. First, the influence of setting was selected for study because different forms of MPA (e.g., Kenny, 2011) may be expressed in different performance settings. For example, someone with focal MPA may be anxious only in formal solo performance settings, whereas someone with MPA in the context of generalized SAD is likely to be anxious in all three settings. A musician whose anxiety is tied to poor self-evaluation, as in Kenny's third type of MPA, may even experience distress performing or practicing alone (Cox & Kenardy, 1993). Next, specific features of social anxiety were selected for study, due to the SAD's multifaceted nature (Bögels et al., 2010). SAD includes both social performance anxiety, which is fear of being scrutinized while performing certain activities, and social interaction anxiety, which is distress about interacting in social situations (Mattick & Clarke, 1998). Fear of negative evaluation is a core concern in SAD regardless of social context (Weeks et al., 2005). Finally, certain anxious cognitions are typical in performance situations; for example, someone making a speech may think, 'What I say will probably sound stupid' (Hofmann & DiBartolo, 2000). In the current study, four facets of social anxiety identified as related but distinct constructs that characterize SAD (Bögels et al., 2010; Weeks et al., 2005) were selected for examination: 1) social performance anxiety, 2) social interaction anxiety, 3) fear of negative evaluation, and 4) cognitions while in a common, non-musical performance situation (public speaking).

Hypotheses

Two primary hypotheses were examined. First, we hypothesized that performance settings differ in the level of MPA associated with them. Musicians report highest levels of music performance anxiety in relation to solo performance, less in relation to group performance, and least

in relation to practice. This hypothesis was based on the findings of Cox and Kenardy (1993), who theorized that, compared to group performance and practice settings, MPA in the solo setting is the highest because the threat of the musician being the sole object of negative social evaluation is highest in this context. Second, we hypothesized that different facets of social anxiety predict MPA in different performance settings. Social interaction anxiety and social performance anxiety predict MPA in solo, but not group or practice, settings. This hypothesis was based on the finding that social anxiety as measured by the SPAI was only predictive of MPA in solo performance settings (Cox & Kenardy, 1993). Due to contradictory past research on fear of negative evaluation and MPA (e.g., Osborne and Franklin, 2002), no specific hypothesis was made for this variable. Finally, because no research has been conducted on cognitions related to other performance domains and MPA, no specific hypothesis was made for cognitions while engaged in public speaking.

Method

Participants

A sample of $N = 130$ professional musicians (64 female, 66 male) completed a series of self-report measures on Survey Monkey. Various types of instrumentalists and vocalists participated (see Table 1). In this study, we defined professional musicians by the following two qualification questions: 'Is music performance involved in your current career, or the career that you are working towards or studying for?' and 'Do you perform in at least 4 or more performances per year (i.e., public orchestra performances, recitals, or non-classical gigs) not including classroom work/performances (i.e., required juries, classroom performances or examinations)?' If participants responded 'no' to either question, they were automatically excluded.

The survey was accessed by a specific web link that was distributed by invitation. Potential participants were recruited by virtue of their association with a specific music organization, employer, school, or music website.[1] Also, participants were asked to recommend the study to other performance musicians by forwarding the survey link to other potential participants.

Table 1. Sample demographics.

Principal instrument	*n*	%
Piano	18	13.8
Strings	46	35.3
Percussion	10	7.7
Brass	16	12.3
Woodwinds	18	13.8
Vocalist	10	7.7
Harmonica	6	4.6
Other	6	4.6
Medications use for MPA	27	20.8
	Mean	*SD*
Number of performances per year	53.1	56.1
Age (years)	34.9	12.6
Years of study on primary instrument	19.8	10.7

This second strategy is known as snowball sampling, a form of chain sampling where study participants recruit additional participants from among their acquaintances (Rubin & Babbie, 2010).

Measures

Music performance anxiety measures. To measure music performance anxiety, the Performance Anxiety Questionnaire (PAQ) was administered, which contains 20 statements: 10 describing cognitions and emotions, and 10 describing somatic complaints during musical performances (Cox & Kenardy, 1993). The PAQ is a measure of how frequently the participant experiences these symptoms in three performance settings: practice, group public performances, and solo public performances. For example, the PAQ has statements including 'I have sweaty palms,' and 'I feel in control of the situation.' For each performance setting, participants respond to how often they experience these statements on a five-point scale, ranging from one (*never*) to five (*always*). Because psychometric data for the PAQ have not been previously published, basic measurement properties were explored by comparing it to the Performance Anxiety Inventory (PAI; Nagel, Himle, & Papsdorf, 1981), a 20-item measure of anxiety symptoms experienced by musicians in recital situations that has been extensively used in studies of MPA. Internal consistency of the total score ($\alpha = 0.84$), and of each subscale (practice $\alpha = 0.87$, group $\alpha = 0.91$, solo $\alpha = 0.91$) was acceptable. The PAQ total score correlated highly with the PAI ($r = 0.75$, $p < .01$).

Social anxiety measures. Four measures, each assessing a specific facet of social anxiety, were administered.

Cognitions during public speaking. To explore the relationship between MPA and performance anxiety in non-musical settings where critical evaluation from others is also realistically likely, typical cognitions during public speaking were measured. The Self-Statements during Public Speaking Scale (SSPS) was administered, which is a 10-item self-report questionnaire that assesses fearful thoughts that typically arise during public speaking (Hofmann & DiBartolo, 2000). It consists of two five-item subscales: positive self-statements (e.g., 'I can handle everything') and negative self-statements (e.g., 'A failure in this situation would be more proof of my incapacity'). The respondent is asked to rate the degree to which he or she agrees with each item on a six-point scale ranging from zero (*you do not agree at all*) to five (*you agree extremely with the statement*). The two SSPS subscales have been found to have both good convergent and discriminant validity (Hofmann & DiBartolo, 2000). The positive and negative SSPS subscales are highly correlated ($r = -.58$ and $r = .67$, respectively) with the Personal Report of Confidence as a Speaker Questionnaire (PRCQ; Paul, 1966), another measure which also addresses public speaking anxiety. Additionally, the SSPS subscales show an expected moderate correlation with other measures of SAD, such as the Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969) and the SPAI (Hofmann & DiBartolo, 2000). In the current study, internal consistency of both the positive and negative cognitions subscales was satisfactory, $\alpha = .83$ and $\alpha = .88$, respectively.

Social anxiety. The Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS) are companion scales designed to measure two core components of social anxiety (Mattick & Clarke, 1998). The SIAS consists of 20 items that assess cognitive, affective, and behavioral reactions to social interaction situations. Sample items for the SIAS include 'I become tense if I

have to talk about myself or my feelings,' and 'when mixing socially, I am uncomfortable.' As well, the SPS contains 20 items that assess cognitive, affective, and behavioral reactions to situations involving being observed by others while engaged in activities such as eating or writing. Sample items for the SPS include 'I become anxious if I have to write in front of other people,' and 'I fear I may blush when I am with others.' Items on both measures are rated on a five-point scale ranging from 0 (*not at all characteristic or true of me*) to 4 (*extremely characteristic or true of me*). The SIAS and the SPS were used in combination in this study, as social interaction anxiety and social performance anxiety comprise two main domains that are feared by individuals with SAD (Antony, Orsillo, & Roemer, 2001). Both scales have been shown to possess highly satisfactory levels of internal consistency and test–retest reliability (Mattick & Clarke, 1998). Also, they both have expected correlations with other measures assessing SAD and have been shown to be able to discriminate between SAD, agoraphobia, and specific phobia samples, and between SAD and nonclinical samples (Mattick & Clarke, 1998). The SPS and SIAS are highly intercorrelated ($r = .72$), yet they seem to measure different constructs. Brown and colleagues (1997) found that the number of social interaction situations rated in a structured interview as at least moderately feared correlated more strongly with the SIAS, whereas the number of social performance situations rated as moderately or highly feared correlated more strongly with the SPS. In the current study, internal consistency of the SIAS and the SPS were $\alpha = .95$ and $\alpha = .90$, respectively.

Fear of negative evaluation. The Brief Fear of Negative Evaluation (BFNE) scale was used to assess fear of negative evaluation, a core feature of SAD (Watson & Friend, 1969). It is a brief, 12-item version of the original 30-item Fear of Negative Evaluation scale which assesses the fear of the loss of social approval (Watson & Friend, 1969). Sample items include 'I am frequently afraid of other people noticing my shortcomings,' and 'I am afraid that people will find fault with me.' The BFNE uses a five-point Likert-type rating scale, ranging from one (*not characteristic of me*) to five (*extremely characteristic of me*) to assess the degree to which the respondent experiences apprehension at the prospect of being evaluated negatively. The BFNE has highly satisfactory inter-item reliability ($\alpha = .97$) and a high two week test–retest reliability ($r = .94$; Collins, Westra, Dozois, & Stewart, 2005). Also, discriminate function analysis supported the validity of the BFNE (Collins et al., 2005). In the current study, the BFNE had good internal consistency ($\alpha = .92$).

Analyses

In order to examine the influence of setting on MPA, a single-factor, repeated-measures ANOVA was used with the PAQ subscales as the dependent variable to test the hypothesis that musicians experience significantly different levels of MPA in different performance settings (solo, group, and practice). Post-hoc analyses tested the specific hypothesis that solo music performance settings are the most anxiety provoking, relative to group and practice settings. Cohen's *d* was calculated as an indicator of effect size and is interpreted as small, $d = 0.2$; medium, $d = 0.5$; and large, $d = 0.8$ (Cohen, 1988).

In order to explore the association of specific features of social anxiety with MPA, three regression analyses were conducted. Specifically, the SIAS, the SPS, the SSPS, and the BFNE were entered as predictors of MPA in specific settings (solo, group, and practice settings, respectively). It was predicted that social anxiety as measured by the SIAS and SPS would predict MPA in solo settings. Because of the lack of research on cognitions during public speaking and fear of negative evaluation in relation to MPA, no specific predictions were made for the SSPS and the BFNE.

Table 2. Descriptive statistics for the performance anxiety questionnaire.

Setting	M	SD	α
Practice	38.40	9.78	.87
Group	46.53	12.12	.91
Solo	56.81	14.22	.91

Note. α indicates Cronbach's alpha coefficient

Results

MPA across performance settings

The repeated measures ANOVA showed that setting had a significant main effect on performance anxiety, $F(2, 258) = 200.64$, $p < .001$, $\eta_p^2 = .69$. Follow-up tests revealed that musicians experienced different levels of MPA which increase significantly from practice to group, $t(129) = 10.32$, $p < .001$, $d = 0.90$; and from group to solo settings, $t(129) = 11.77$, $p < .001$, $d = 1.03$ (see Table 2).

Relationship between social anxiety variables and MPA

Regression analyses were used to examine the association of specific facets of social anxiety and MPA. In the analysis examining the practice setting, a significant model was noted, $F(5, 102) = 5.6$, $p < .001$; significant predictors included the BFNE and the SPS. In the analysis examining the group setting, a significant model was also found, $F(5, 102)$ 11.11, $p < .001$, and again the BFNE and the SPS were significant predictors. Lastly, in the analysis examining the solo setting, a significant model was found, $F(5, 102) = 12.44$, $p < .001$, with the positive subscale of the SSPS (inversely) and the BFNE emerging as significant predictors. In each setting, social anxiety significantly predicted MPA with increasing R^2 values (see Table 3).

Discussion

Music performance anxiety is a prevalent and distressing problem among professional musicians. The current study was designed to assess whether MPA differs across performance settings, and whether aspects of the broader construct of social anxiety uniquely predict MPA in those settings. The results support the hypothesis that performance musicians experience different levels of anxiety in different music performance situations, increasing from practice, to group, to solo settings, consistent with previous research highlighting the importance of the musician being the focus of social evaluation in the solo context (Cox & Kenardy, 1993). Findings also provide partial support for the hypothesis that measures of social anxiety predict MPA in different performance settings. Specifically, the overall regression model, using five measures of social anxiety as independent variables, was significant for solo settings (consistent with Cox & Kenardy, 1993). However, contrary to hypotheses, social interaction anxiety and social performance anxiety were not significant as individual predictors. Rather, unique predictors in solo settings included the fear of negative evaluation and positive self-statements during public speaking (inversely). Contrary to hypotheses and to the findings of Cox and Kenardy, significant regression models were also found for practice and group performance settings. In those settings, the fear of negative evaluation and social performance anxiety contributed significantly to the variance in MPA. Fear of negative

Table 3. Multiple regression analyses predicting music performance anxiety.

	PAQ practice		PAQ group		PAQ solo	
	β	t	β	t	β	t
Predictor						
Positive Self Statements during Public Speaking (SSPS positive)	−.11	−1.01	−.08	−.83	−.21*	−2.24
Negative Self Statements during Public Speaking (SSPS negative)	−.14	−1.08	−.13	−1.11	−.05	−.41
Social Interaction Anxiety (SIAS)	−.20	−1.43	−.07	−.53	−.11	−.88
Social Performance Anxiety (SPS)	.38**	3.02	.43***	3.71	.20	1.73
Fear of Negative Evaluation (BFNE)	.30*	2.45	.33**	2.95	.46***	4.22
Total R^2	.22		.35		.38	

* $p < .05$; ** $p < .01$; *** $p < .001$.

evaluation, a central component of social anxiety (Weeks et al., 2005), was a constant unique predictor of MPA across performance settings and thus appears to be a salient link between MPA and generalized SAD.

Performance setting

Adding to work by Cox and Kenardy (1993), these results emphasize that the nature and degree of MPA varies by performance setting and increases from practice to group to solo performance. Thus, performance settings should be conceptualized as a prominent factor in MPA. Although anxiety in the practice setting was the lowest of the three settings that were examined, it is notable that some level of anxiety during practice was reported by the professional musicians in this study. Because the PAQ does not specify whether respondents should imagine practicing alone, in a group, or with a small audience (e.g., with an instructor), results using the practice subscale are difficult to interpret. It is possible that musicians are envisioning an audience or ruminating about a future performance or upcoming music-related evaluation, even during practices where no one else is present, a pattern consistent with the third type of MPA described by Kenny (2011). In other practice settings, sometimes other individuals are present (e.g., rehearsals), and evaluative concerns could be activated even if the situation is not an official performance. In these and in group performance settings, socially anxious individuals who fear possible scrutiny while conducting routine activities (the observation anxiety characteristic of SAD; Bögels et al., 2010) would be expected to experience greater MPA. Our finding that social performance anxiety (as measured by the SPS) predicted MPA in practice and group settings is consistent with Kenny's second type of MPA, which is an expression of generalized SAD. In solo settings, the experienced anxiety was reported to be the most intense, as the performer is often under extreme performance pressure (e.g., a recital or a difficult concerto). In this context, the likelihood of evaluation, positive or negative, is highly probable, and the high level of experienced anxiety matches these high stakes. Because a different pattern was evident in the predictors of MPA in solo settings, relative to group and practice, we speculate that MPA in this context is most similar to the focal anxiety Kenny described, which overlaps with Bögels and colleagues' characterization of SAD in formal performance situations.

Fear of negative evaluation

Despite the differences between settings, the fear of negative evaluation emerged as a significant component of music performance anxiety in all three performance settings. Cognitive models highlight the importance of fear of negative evaluation in the development and maintenance of SAD (Rapee & Heimberg, 1997; Weeks et al., 2005). The current findings suggest that fear of negative evaluation may be the common thread linking MPA to other forms of SAD, as it appears to be a shared factor among people who are anxious about musical performance in any of the three settings, as well as those with other forms of social performance or interaction anxiety. Fear of negative evaluation may play an especially large role in MPA, because in music performance, evaluation is realistically likely from a public audience, teachers, judges, and peers, and such an evaluation can be highly relevant to career and self-concept. Moreover, most musicians feel evaluated against a perfect standard (Gabbard, 1980). Therefore, feeling evaluated against a perfect standard, and with almost certain evaluation, an individual who fears negative evaluation off stage is likely to experience marked anxiety when placed in a performance situation on stage. Thus, it appears that a fear of negative evaluation in general carries over into music performance, contributing to experienced anxiety on stage.

The current findings contrast with Osborne and Franklin's (2002) research where the fear of negative evaluation in general was significantly correlated with MPA but was not uniquely predictive. However, in their regression model, socially anxious cognitions of the consequences of negative evaluation and the likelihood of a negative evaluation specific to a musical performance were uniquely predictive of MPA, and it is possible that due to conceptual overlap, these two variables explained the variance better than a general fear of negative evaluation as assessed by the BFNE. Furthermore, the current study differs from that of Osborne and Franklin in using only professional musicians and in having a substantially larger sample size. Although Osborne and Franklin's study (2002) suggests that fear of negative evaluation specific to musical performance is an even stronger predictor of MPA, our results indicate that the general fear of negative evaluation thought to underlie all social anxiety is also an important contributor.

MPA and other performance domains

Anxiety in music performance seems to share additional characteristics of social anxiety in other domains. Social performance anxiety in everyday situations, including those where little skill is needed (e.g., eating or writing in front of others), was associated with MPA in practice and group settings. It is notable that in solo music performance settings, general social performance anxiety did not remain a unique predictor of MPA. It is possible, given the high level of anxiety that was reported in the solo music performance setting, that other factors emerged as more robust predictors. As noted in the regression analysis, a significant inverse association was noted between MPA in the solo performance setting and positive self-statements while engaged in public speaking. The lack of positive cognitive coping in the public-speaking domain seems to be associated with music performance and may explain higher levels of MPA. This gives some additional evidence for similarities between MPA and anxiety in other non-music performance contexts. In sum, these results emphasize both common factors between MPA and social anxiety, particularly fear of negative evaluation, and specific factors that differentiate among musical performance settings (e.g., the absence of positive self-statements during performance). More research is needed to explore additional similarities and differences between different social performance contexts.

The results of the current study give some support for the conceptualization of MPA as a type of social anxiety, specific to one performance domain. Significant regression models were noted between the general social anxiety variables and MPA in each setting, suggesting that if musicians have high social anxiety in general, it is also likely they will have problems when in music performance situations. However, our findings do not preclude the possibility that for some musicians, anxiety could be primarily or solely focused on the performance stage. Although in the current study, social performance anxiety was uniquely predictive of MPA in practice and group settings, social interaction anxiety was not predictive of MPA in any performance setting. This supports the explanation of MPA as a focal anxiety because specific performance concerns appear to be more strongly related to MPA than more generalized social interaction concerns.

Limitations

This study has some limitations. First, due to the nature of the recruitment strategy, it is possible that individuals who chose to reply to the e-mail survey were struggling with MPA to a greater extent than those who did not respond. Thus, the current study potentially did not yield a randomly-selected sample, suggesting that additional research, using stratified random sampling, may increase the generalizability of the current results. Additionally, the SSPS was used to examine anxiety during public speaking and measures positive and negative cognitions during public speaking. Although cognitions are a fundamental component of anxiety, they do not represent a complete picture of performance anxiety in this domain, which in turn may not be representative of other types of performances (e.g., dance, athletic competition). Therefore, future research is needed to investigate the relationship between MPA and a full representation of anxiety in public speaking situations, as well as the relationship between MPA and anxiety in other performance domains. Lastly, although this study gave some support to current models of MPA (such as Kenny's three subtypes; 2011), future research is needed to characterize the factor structure of MPA and its relationship with other forms of social anxiety.

Conclusions

The current study provides useful insights into the relationship between anxiety on and off stage. First, different performance situations evoke different degrees of anxiety, with musicians reporting the most anxiety in solo performances. Second, social anxiety does usefully predict MPA, with social performance anxiety predicting MPA in practice and group settings, and fewer positive self-statements during public speaking predicting MPA in solo settings. Also, the fear of negative evaluation was associated with MPA across all three performance settings, suggesting that the anxiety about others' judgments experienced off stage seems to follow a performer on stage. Understanding the relationship between anxiety experienced during musical performance and various other social evaluative anxieties in everyday life will facilitate the development of cognitive models of MPA and potentially help guide treatment of MPA grounded in well-validated interventions for social anxiety more broadly. The current findings suggest that targeting concerns over negative evaluation may be particularly useful in the treatment of MPA, while treating more general social interaction fears may be less efficacious.

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Ethical approval

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Note

1. Professional organizations like the Arkansas Symphony Orchestra, the Georgia Symphony Orchestra, the Boise Symphony Orchestra, the Memphis Symphony Orchestra, and the Memphis Blues Society were contacted and graciously distributed an email invitation to their musicians. An Atlanta-based professional violinist, a contact of the first author, agreed to forward the study to her colleagues, and a Memphis-based blues and harmonica musician, a contact of the third author, agreed to forward the study to his colleagues. Two online music websites geared towards professional musicians, BulletProofMusician.com and the UK-based PercussionMusicOnline.com, agreed to post a link on their website. Music department faculty at the following institutions agreed to forward it to colleagues and graduate students: the University of Memphis, the University of Mississippi, the University of Louisiana at Lafayette School of Music, and the University of Central Arkansas.

References

Antony, M. M., Orsillo, S. M., & Roemer, L. (2001). *Practitioner's guide to empirically based measures of anxiety*. New York, NY: Kluwer Academic/Plenum Publishers.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (13th ed.). Washington, DC: Author.

Bögels, S. M., Alden, L., Beidel, D. C., Clark, L. A., Pine, D. S., Stein, M. B., & Voncken, M. (2010). Social anxiety disorder: questions and answers for the DSM-V. *Depression and Anxiety*, *27*(2), 168–189.

Brown, E. J., Turovsky, J., Heimberg, R. G., Juster, H. R., Brown, T., & Barlow, D. H. (1997). Validation of the Social Interaction Anxiety Scale and the Social Phobia Scale across the anxiety disorders. *Psychological Assessment*, *9*, 21–27. doi:10.1037/1040–3590.9.1.21

Clark, D. B., & Agras, W. (1991). The assessment and treatment of performance anxiety in musicians. *The American Journal of Psychiatry*, *148*, 598–605.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York, NY: Taylor & Francis Group.

Collins, K. A., Westra, H. A., Dozois, D. J., & Stewart, S. H. (2005). The validity of the brief version of the Fear of Negative Evaluation Scale. *Journal of Anxiety Disorders*, *19*, 345–359. doi:10.1016/j.janxdis.2004.02.003

Cox, B. J., & Kenardy, J. (1993). Performance anxiety, social phobia, and setting effects in instrumental music students. *Journal of Anxiety Disorders*, *7*, 49–60. doi:10.1016/0887–6185(93)90020-L

Gabbard, G. O. (1980). Stage fright: Symptoms and causes. *The Piano Quarterly*, *112*, 11–15.

Hofmann, S. G., & DiBartolo, P. M. (2000). An instrument to assess self-statements during public speaking: Scale development and preliminary psychometric properties. *Behavior Therapy*, *31*, 499–515. doi:10.1016/S0005–7894(00)80027–1

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

Leary, M. R. (1983). A brief version of the Fear of Negative Evaluation Scale. *Personality and Social Psychology Bulletin, 9*, 371–375. doi:10.1177/0146167283093007

Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy, 36*, 455–470. doi:10.1016/S0005–7967(97)10031–6

McGinnis, A. M., & Milling, L. S. (2005). Psychological treatment of musical performance anxiety: Current status and future directions. *Psychotherapy: Theory, Research, Practice, Training, 42*, 357–373. doi:10.1037/0033–3204.42.3.357

Nagel, J., Himle, D., & Papsdorf, J. (1981). Coping with performance anxiety. *National Association of Teachers of Singing Bulletin, 37*, 26–27.

Osborne, M. S., & Franklin, J. (2002). Cognitive processes in music performance anxiety. *Australian Journal of Psychology, 54*, 86–93. doi:10.1080/00049530210001706543

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. doi:10.1016/j.janxdis.2004.09.002

Paul, G. L. (1966). *Insight vs. desensitization in psychotherapy: An experiment in anxiety reduction.* Stanford University Press.

Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy, 35*, 741–756. doi:10.1016/S0005–7967(97)00022–3

Rubin, A., & Babbie, E. R. (2010). *Research methods for social work* (9th ed.). Belmont, CA: Wadsworth/Thomson Press.

Steptoe, A., & Fidler, H. (1987). Stage fright in orchestral musicians: A study of cognitive and behavioural strategies in performance anxiety. *British Journal of Psychology, 78*, 241–249. doi:10.1111/j.2044–8295.1987.tb02243.x

Turner, S. M., Beidel, D. C., Dancu, C. V., & Stanley, M. A. (1989). An empirically derived inventory to measure social fears and anxiety: The Social Phobia and Anxiety Inventory. *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 1*, 35–40. doi:10.1037/1040–3590.1.1.35

van Kemenade, J. M., van Son, M. M., & van Heesch, N. A. (1995). Performance anxiety among professional musicians in symphonic orchestras: A self-report study. *Psychological Reports, 77*, 555–562. doi:10.2466/pr0.1995.77.2.555

Watson, D., & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology, 33*, 448–457. doi:10.1037/h0027806

Weeks, J. W., Heimberg, R. G., Fresco, D. M., Hart, T. A., Turk, C. L., Schneier, F. R., & Liebowitz, M. R. (2005). Empirical validation and psychometric evaluation of the Brief Fear of Negative Evaluation Scale in patients with social anxiety disorder. *Psychological Assessment, 17*, 179–190. doi:10.1037/1040–3590.17.2.179