Music Performance Anxiety

Music Performance Anxiety:

A Comprehensive Update of the Literature

By

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To our beloved aunty, whose courage, dignity and peacefulness inspired every single person who knew her, and whose inconditional love keeps guiding us every single day.

“Nothing is more devastating to a performing artist than not having the chance to be on stage and, as the pervasiveness of performance anxiety attests, nothing is more threatening than having that chance” (Plaut, 1990)

CONTENTS

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INTRODUCTION

MUSIC PERFORMANCE ANXIETY: DEFINITION OF THE TERM

Music Performance Anxiety (MPA) is a complex phenomenon caused by the interaction of many factors, including genetics, environmental stimuli, and the individual's experience, emotions, cognitions and behaviours (Kenny, 2011). According to her definition, Music Performance Anxiety is the experience of marked and persistent anxious apprehension related to musical performance that has arisen through specific anxiety conditioning experiences and which is manifested through combinations of affective, cognitive, somatic and behavioural symptoms. It may occur in a range of performance settings, but is usually more severe in settings involving high ego investment and evaluative threat. It may be focal (i.e. focused only on music performance) or occur comorbidly with other anxiety disorders, in particular social phobia. It affects musicians their entire lives and is at least partially independent of years of training, practice and level of musical accomplishment. It may or may not impair the quality of the musical performance (Kenny, 2008). Moreover, the three causes of MPA most commonly cited by musicians are "pressure from self", "excessive arousal", and "inadequate preparation for performance" (Kenny et al., 2014).

However, the definition of MPA has not always been so clear. It can be found in the literature that Performance Anxiety is often confused with the term Stage Fright, and some authors use both terms interchangeably (Salmon, 1990). Stage Fright affects 80% of the population when they are required to perform in front of an audience. It may affect musicians, singers, dancers, athletes, actors, public speakers, or students when test-taking. Thus, stage fright is, a normal reaction which should be optimised to enhance accomplishments in the performance situation. People affected by Stage Fright may report some of the following symptoms: psychological (doubts about one's self, failure expectancy, or catastrophizing), physical (such as higher breath and heart frequency, dry mouth, shaking, sweating palms, etc., as a consequence of sympathetic nervous system hyperactivation)

and behavioural (a combination of activeness and motivation on the one hand, and retraction and avoidance on the other hand). Depending on how intense these symptoms are and how they interfere with the performance, we talk about Performance Anxiety. In this case, those aspects of Stage Fright which diminish accomplishment outweigh the positive facets, thus necessitating treatment (Spahn, 2006). Consequently, it is essential that authors use both terms adequately. While Stage Fright refers to a normal reaction, Performance Anxiety is a pathological disorder and necessitates treatment.

The definition of MPA by Kenny is based on Barlow's (2000) model of anxiety, an integrated set of triple vulnerabilities: generalized biological (heritable), generalized psychological (early experiences in developing a sense of control over salient events), and more specific psychological vulnerabilities (anxiety associated with certain environmental stimuli through learning processes). According to this model, the systems affected in anxiety are the somatic (hyperarousal or acute stress response that produces a range of bodily sensations that prepare the body to meet the perceived challenge), the emotional (anxiety, fear, panic), the cognitive (worry, dread, inattention and distractibility, lack of concentration, memory loss), and the behavioural manifestations (technical errors, memory loss, performance breaks, avoidance of performance opportunities) (Kenny, 2008).

Performance anxiety usually occurs as an isolated disorder, affecting only one specific part of a person's life (Kenny & Ackermann, 2007). However, for a significant minority, other co-morbid disorders may be present. The most common of them is generalised anxiety disorder, which appears to co-occur in about one third of those presenting with severe performance anxiety (Sanderson, DiNardo, Rapee & Barlow, 1990). Such individuals have a long history of generalised worry and apprehension in most facets of their lives, not solely in situations requiring performance. Others may qualify for a diagnosis of social phobia (social anxiety) if they demonstrate significant impairment in interactions with others as well as the performance setting, while meeting the criteria for social phobia presented in DSM IV (APA 1994). About 10-15% of those also meet criteria for clinical depression (Kessler, Stang, Wittchen, Stein & Walters, 1999). For a small group of sufferers, there may be underlying psychological conflicts. One of the more common of these is the "imposter syndrome" (Lazarus & Abramovitz, 2004) whereby the individual fears that an individual will eventually be exposed as a fraud, with every performance potentially confirming his underlying fear. However, the highly anxious

individual does not necessarily demonstrate impaired or inferior performance compared to low anxious individuals (Strahan & Conger, 1998).

Anxiety is a two-factor structure, with both state and trait components. State anxiety is a transitory emotional state characterised by heightened tension and apprehension. Trait anxiety refers to relatively stable individual differences between people in their tendencies to respond to situations perceived as threatening with elevations in state anxiety. Anxiety occurs on a continuum from mild to severe. It has also different forms: adaptative, reactive, maladaptative, and pathological. In adaptative anxiety, the body adapts to a threatening or challenging situation by increasing the state of arousal. This type of anxiety may be experienced as excitement and may enhance coping and improve performance. Reactive anxiety results from actual or perceived inability to meet the demands of the situation. Maladaptative anxiety impairs thinking and problem-solving and has a negative effect on behaviour or performance. Pathological anxiety occurs in situations in which the individual can not identify the cause of the anxiety. This state is often referred to as Generalised Anxiety Disorder (Kenny, 2008).

Several theories have been proposed to explain the origins of anxiety. A family environment characterised by limited opportunity for personal control is associated with the development of anxiety (Chorpita, Brown, & Barlow, 1998). Building a positive learning history during childhood by providing opportunities to cope adaptively with challenges should immunise children against the development of anxiety as a response to subsequent negative learning episodes (Barlow, 2002; Field, 2006). Ehlers (2003) showed that people with panic attacks report observing more panic behaviours in their parents than people with other anxiety disorders and people with no anxiety disorder. Many people who develop anxiety disorders report early-learning experiences as children (Chambless, Caputo, Gright, & Gallagher, 1984). Recent research has identified various roles for different neural substrates in fear conditioning (Kenny, 2008): the amygdala is involved in the physiological response to conditioned fear (Gazzaniga, Irvy, & Magnun, 2002), while the hippocampus is involved in the associative learning component (Squire & Zola-Morgan, 1991).

Very young children rarely experience performance anxiety; on the contrary, they usually love to perform. Therefore, a transition takes place between childhood (not presenting MPA) and adolescence (specifically from 14 to 19 years old; Osborne, Kenny, & Holsomback, 2005) and

adults suffering from MPA. This transition is due to a combination of factors: innate temperament, increasing cognitive capacity and self-reflective function, type of parenting and other interpersonal experiences, perception and interpretation of surroundings, technical skill and mastery, and specific performance experiences that may have positive or negative outcomes. Furthermore, it has been proved that the capacity for self-evaluation (self-criticism) emerges in middle to late adolescence (Jackson & Lurie, 2006).

Some authors classify performance anxiety as a subcategory of social phobia (Hook & Valentine, 2002; Turner, Johnson, Beidel, Heiser, & Lydiard, 2003). According to DSM-5 (American Psychiatric Association, 2013), performance anxiety is a subtype of social anxiety disorder (SAD). In order for someone to qualify as having SAD, they need to have suffered from persistent fear, anxiety or avoidance for at least 6 months, and to have considerably impaired social, occupational or general functioning. Although there are correlations between MPA and certain aspects of SAD, such as fear of negative evaluations and the perceived exaggerated consequences of such evaluations, particularly in solo performance, their interactions remain unclear (Goren, 2014).

The classification of social phobia into generalized (anxiety is experienced about interpersonal interactions generally), non-generalized (anxiety is experienced in settings in which the individual is being scrutinized), and specific (anxiety occurs for very few performance situations) sub-types (Turner, Johnson, Beidel, Heiser, & Lydiard, 2003) may help in the clarification of MPA as a form of specific social phobia (Kenny, 2008). However, several differences exist between social phobia and performance anxiety. People suffering from performance anxiety are more likely to have higher expectations of themselves (Abbot & Rapee, 2004), or a greater fear of their own evaluation of their performance. Social phobia, on the other hand, is fear of scrutiny from others (Stoebert & Eismann, 2007), though it is also present in MPA as well as a higher degree of post-event rumination (Abbott & Rapee, 2004) and a continued commitment to the feared performance situation, as opposed to avoidance of the feared situation in social phobia (Powell, 2004). Furthermore, in social phobia the audience is often imaginary. In other words, socially phobic individuals fear that everyone is watching and judging them, when the reality may be that the person has not been noticed in the feared social setting (Kenny, 2008). For the artistic or sports performer, the audience is real and performers are usually correct in their assessment that people are watching and judging them (Brotons, 1994). Finally, aspiring and professional

musicians are highly invested in their identities as musicians, and find it difficult to disentangle their self-esteem from their musical self-efficacy (Kemp, 1996). This fact makes musicians and other high level performers more vulnerable to anxiety because of the perception that failure as a performing artist signifies failure as an individual. (Chesky & Hipple, 1997).

An optimal performance is determined by a complex interaction between person characteristics, task characterisics, and performance setting (Kenny, 2008). Person characteristics are mainly determined by anxiety (understood as the state experienced when one believes that the demands are excessive or unachievable) and perfectionism. Perfectionism has both positive and negative sides (Stoebert & Eismann, 2007). Striving for perfection is associated with intrinsic motivation, higher effort, and higher achievement, whereas perceived pressure is associated with intrinsic motivation, extrinsic motivation and higher distress. Task characteristics contain task complexity and task mastery (Kenny & Ackermann, 2007). Task complexity can be explained from the Yerkes-Dodson Inverted U Curve (Yerkes & Dodson, 1908), which shows the relationship between the amount of physiological arousal experienced by a performer and the quality of his/her performance. Optimal performance on simple tasks will increase as arousal increases but will deteriorate on complex tasks after a moderate level of arousal is exceeded. With task mastery, a similar relationship has been observed between the degree to which the task has been practiced achieving mastery (automaticity) and the amount of physiological arousal needed to produce an optimal performance (Kenny, 2008). Even at ideal levels of arousal, low practice will produce a suboptimal performance. A well-practised piece will be performed well at higher levels of arousal but will also suffer if arousal exceeds a certain optimal maximum (Kokotsaki & Davidson, 2003). Focused attention shows a similar relationship, increasing when there are low to moderate levels of arousal but decreasing with very high levels of arousal (Kenny & Ackermann, 2007). Finally, performance setting influences the level of performance. Musicians are more likely to feel anxious under conditions of evaluation, jury performances and concert/recitals than they would under practice conditions (Kenny & Ackermann, 2007).

Most forms of performance anxiety are difficult to treat, and anxiety levels after treatment rarely reduce to those of non-anxious people (Kenny & Ackermann, 2007). The best form of treatment is to prevent its occurence. Awareness of the availability of effective treatments for musicians with performance anxiety should be introduced to student musicians at an early

stage of their musical training. Sound pedagogy, appropriate parental support and expectations, and the learning of self-management strategies early in one's musical education can help to mitigate the effects of entering a highly stressful profession. Repeated exposure to the feared situation (music performance) in the absence of the development of skills and strategies to ensure success is likely to have a detrimental effect on the performer with potentially devastating consequences (Kenny, 2008). Repertoire should be well within the technical capacity and interpretative abilities of the student and the material should be over-learned to the point of automaticity (Kenny & Ackermann, 2007).

Psychological skills training (e.g. goal setting, concentration, imagery, self-talk, arousal regulation) has been used successfully in sports for the last five decades, but rarely with musicians (Hatfield, 2016). Some data on the thoughts of musicians under pressure suggest that unproductive coping strategies might be positively correlated with both MPA (Thomas & Nettlebeck, 2014) and performance quality. According to Matei et al, the relationship between performance quality and performance anxiety is complex and there might be scope for studying them separately. However, it is difficult to assess performance quality other than subjectively. Furthermore, although reframing performance anxiety as excitement might not reduce levels of anxiety (Brooks, 2014), performance quality might nevertheless improve.

In order to have a better understanding of Musical Performance Anxiety, a review of the literature has been done and it is presented below. Music Performance Anxiety has been proven to arise independently of age, experience and performance setting (Kenny, 2006). Great musicians like Pau Casals (Plaut, 1990) or Enrico Caruso (Spahn, 2006) suffered from MPA. Females are more affected than males (Nagel, 1988; LeBlanc et al., 1997; Miller et al., 2004; Rae et al., 2004; and Osborne et al., 2008). Solo performances showed higher MPA scores than ensemble performances (Simon et al., 1979; Rife et al., 2000). Jury evaluations produce higher levels of MPA, compared to non-evaluation context situations (Craske et al., 1984; Salmon et al., 1989; Rae et al., 2004; and Yoshie et al., 2008). Catastrophizing has been found to be the best predictor of MPA (Zinn et al., 2000; Liston et al., 2003) and an association between arm stiffness and MPA has recently been reported (Yoshie et al., 2008). Both facts may contribute to the reason why Cognitive-Behavioural Interventions have proved to have good results on treating MPA, as they focus on changing faulty thinking patterns that give rise to maladaptive behaviours, as well as

changing the dysfunctional behaviours that arise when people feel anxious (being excessive muscle tension the main symptom) (Kenny, 2004).

This review classifies studies under four main elements (Epidemiology, Methods, Intervention, and Concept) and analysed with the Evidence-based medicine (EBM) criteria. Differences in MPA will be shown among age groups, gender, and solo vs. ensemble performances. Scales that measure MPA are also provided. A review of the treatments for MPA was done, also, focusing on those that have proven to be more effective. A number of coping strategies, predictors, and varying context situations, among other interesting facts, are also analised. At the end of the review, conclusions regarding how studies were performed are provided.

Literature Review

Evidence-based medicine (EBM) aims to apply evidence gained from the scientific method to certain parts of medical practice. It seeks to assess the quality of evidence relevant to the risks and benefits of treatments (including lack of treatment). According to the Centre for Evidence-Based Medicine, "Evidence-based medicine is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients." EBM recognizes that many aspects of medical care depend on individual factors such as quality and value-of-life judgments, which are only partially subject to scientific methods. EBM, however, seeks to clarify those parts of medical practice that are in principle subject to scientific methods and to apply these methods to ensure the best prediction of outcomes in medical treatment, even as debate about which outcomes are desirable continues. The foundation of evidence-based medicine is the systematic review of evidence for particular treatments, mainly randomized controlled trials. The Cochrane Collaboration leads this effort. A 2001 review of 160 Cochrane systematic reviews in the 1998 database revealed that, according to two readers, 41.3% concluded positive or possibly positive effect, 20% concluded evidence of no effect, 8.1% concluded net harmful effects, and 21.3% of the reviews concluded insufficient evidence. A review of 145 alternative medicine Cochrane reviews using the more up-to-date 2004 database revealed that 38.4% concluded positive effect or possibly positive (12.4%) effect, 4.8% concluded no effect, 0.69% concluded harmful effect, and 56.6% concluded insufficient evidence.

Evidence-based medicine categorizes different types of clinical evidence and ranks them according to the strength of their freedom from the various

biases that beset medical research. For example, the strongest evidence for therapeutic interventions is provided by systematic review of randomized, double-blind, placebo-controlled trials involving a homogeneous patient population and medical condition. In contrast, patient testimonials, case reports, and even expert opinion have little value as proof because of the placebo effect, the biases inherent in observation and reporting of cases, difficulties in ascertaining who is an expert, and more. Systems to stratify evidence by quality have been developed. In this review we are using the classification given by Richter, B., Zander, M., & Spahn, C. (2007):

- Level I: Systematic review of randomized, double-blind, placebo-controlled trials. A meta-analysis combines the results of several studies that address a set of related research hypotheses.
- Level II: Evidence obtained from at least one properly designed randomized controlled trial.
- Level III: Evidence obtained from well-designed controlled trials without randomization.
- Level IV: Evidence obtained from non-experimental, non-randomized trials.
- Level V: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

I.A. EPIDEMIOLOGY

1. Children musicians

STUDIES	EVALUATION	CRITERIA
Simon, J. A., & Martens, R. (1979): Children's anxiety in sport and nonsport evaluative activities.	Level III	Evidence obtained from well-designed controlled trials without randomization.
LeBlanc, A., Jin, Y. C., Obert, M., & Siivola, C. (1997): Effect of audience on MPA.	Level III	Evidence obtained from well-designed controlled trials without randomization.
Ryan, C. (1998): Exploring MPA in children.	Level III	Evidence obtained from well-designed controlled trials without randomization.
Ryan, C. (2004): Gender differences in children's experience of MPA.	Level III	Evidence obtained from well-designed controlled trials without randomization.
Ryan, C. (2005): Experience of MPA in elementary school children.	Level III	Evidence obtained from well-designed controlled trials without randomization.

Author	Year Publication	Subject type Study design	Methods	Conclusions
Simon, J. A., & Martens, R.	1979 *Journal of Sport Psychology, 1*, 160-169	749 9-14-year-old boys, comparing anxiety in test, sport and musical activities. Non-randomized study.	Quantitative: Competitive State Anxiety Inventory (CSAI), a 10-item shortened version of Spielberger's (1973) State Anxiety Inventory for Children.	The greatest anxiety was reported by boys performing solo on a musical instrument; performing with a band was responsible for the highest anxiety among group activities.
LeBlanc, A., Jin, Y. C., Obert, M., & Siivola, C.	1997 *Journal of Research in Music Education, 45*, 480-496	27 male and female high school band members performing solos under 3 levels of audience presence: alone in a practice room, in a practice room with one researcher present, and in the rehearsal room with all researchers, a peer group, and a tape recording being made. Non-randomized study.	Quantitative: an analog scale self-report of performance anxiety, heart rate recorded during performance, judges' rating of the final performance. Qualitative: an exit interview.	MPA increases with audience size and perceived importance of the performance. Heart rate was steady across the first two performance conditions but rose significantly at the third. Females presented better performances but reported significantly higher anxiety levels than males in the first and third performance conditions.

Ryan, C.	1998 *Medical Problems of Performing Artists, 13(3),* 83-88	26 12-year-old piano students, by comparing heart rates monitored continuously through a piano lesson and a recital performance for each subject. The state portion of the State-Trait Anxiety Inventory for Children (STAIC) was administered to subjects at the recital. The trait portion of the STAIC, the Coopersmith Self-Esteem Inventory, and individual interviews were completed during non-performance times before and after the recital. Non-randomized study.	Quantitative (heart rate monitoring, STAIC, and Coopersmith Self-Esteem Inventory) and Qualitative (interviews).	Similar physical and physiological symptoms of MPA as adult musicians. Significant increases in heart rate between baseline and recital, and between the "sitting stage-side," "walking onstage," and "playing" stages of the recital. Significant correlations between self-esteem, particularly social self-esteem, and both state anxiety and trait anxiety. Seventeen of the 22 subjects interviewed reported feelings of anxiety when performing in piano recitals, many noting a fear of making mistakes in front of people as the primary cause.
Ryan, C.	2004 *Psychology of Music, 32*, 89-103	26 grade students under 12 years old performing in a piano recital were monitored continuously on measures of heart rate and behaviour. They were interviewed in the months prior to the recital and they completed the State-Trait Anxiety Inventory for Children (STAI-C) immediately after performing. Non-randomized study.	Quantitative (heart monitoring, STAI-C) and Qualitative (interviews).	Girls had substantially higher heart rates than boys immediately prior to but not during their performance; boys had significantly more anxious behaviours than girls both prior to, and during a performance.

Ryan, C.	2005 *International Journal of Stress Management*	173 3-7-year-old children who completed the trait and state form of the STAIC during a regular school day and the state form again on the day of a major school concert.	Quantitative (trait and state form of STAIC).	State anxiety was significantly higher on the day of the school concert and was related to children's level of trait anxiety.

Simon et al. compared the levels of anxiety among children between 9 and 14 years old under different performance tasks (test, sport, and music). They found that music performance was responsible for the highest levels of anxiety. LeBlanc et al. showed that MPA and heart rate increase with audience size and perceived importance of the performance. They also focused on possible gender differences, finding that females presented better performances, but reported significantly higher anxiety levels than males. Ryan (1998) used a group of 12-year-old piano students, finding that they presented similar physical and physiological symptoms of MPA as adult musicians. Many of them noted a fear of making mistakes in front of people as the primary cause. This study also provided significant correlations between self-esteem, particularly social self-esteem, and both state anxiety and trait anxiety. The results from heart rate studies agreed with those shown by LeBlanc et al. Focusing on gender differences, Ryan (2004) found that girls had higher heart rates than boys immediately prior to but not during their performances, while boys had more anxious behaviours than girls both prior to and during a performance. This finding conflicts with LeBlanc's results that females had higher anxiety levels than males. However, the group ages vary between both studies, so it could be concluded that boys at the age of 12 present more anxious behaviours than their female peers, both prior to and during a performance. High school females, on the contrary, have higher performance anxiety levels than high school males. In a sample of 3 to 7-year-old children, Ryan (2005) found that state anxiety was significantly higher on the day of the school concert than during a regular school day and that this state anxiety was related to a child's level of trait anxiety. This study shows, surprisingly, the existence of performance anxiety among children between the ages of 3 and 7.

The studies presented here are well-designed and show very interesting results. The number of subjects evaluated is consistent, and the group ages are clearly defined. None of them is randomized, however, so additional well-designed randomized studies would be beneficial, where a well-designed study has large enough samples, clear group age designs, and results showing possible gender differences.

2. Adolescent musicians

STUDIES	EVALUATION	CRITERIA
Wesner, R.B., Noyes, R.Jr. & Davis, T.L. (1990): The occurrence of performance anxiety among musicians.	Level IV	Evidence obtained from non-experimental, non-randomized trials.
Shoup, D. (1995): Survey of performance-related problems among high school and junior high school musicians.	Level IV	Evidence obtained from non-experimental, non-randomized trials.
Britsch, L. (2005): Investigating performance-related problems of young musicians.	Level IV	Evidence obtained from non-experimental, non-randomized trials.
Fehm, L., & Schmidt, K. (2006): Performance anxiety in gifted adolescent musicians.	Level IV	Evidence obtained from non-experimental, non-randomized trials.
Kenny, D. T., & Osborne, M. S. (2006): MPA - new insights from young musicians.	Level III	Evidence obtained from well-designed controlled trials without randomization.
Osborne, M. S., & Kenny, D. T. (2006): Impact of a music performance enhancement program on MPA in secondary school music students.	Level II	Evidence obtained from at least one properly designed randomized controlled trial.
Osborne, M. S. & Kenny, D. T. (2008): The role of sensitizing experiences in MPA in adolescent musicians.	Level III	Evidence obtained from well-designed controlled trials without randomization.
Thomas, J.P. & Nettelbeck, T. (2014): Performance anxiety in adolescent musicians.	Level IV	Evidence obtained from non-experimental, non-randomized trials.

Author	Year Publication Study design	Subject type	Methods	Conclusions
Wesner, R.B., Noyes, R.Jr. & Davis, T.L.	1990 *Journal of Affective Disorders*, 18(3), 177-185	302 music students answered a questionnaire about their experiences with and attitudes about performance anxiety. Non-randomized study.	Quantitative (survey)	16.5% respondents indicated that their musical performance was impaired by anxiety. Over 21% of the respondents indicated that they experienced marked distress while performing and 16.1% indicated that performance anxiety had adversely affected their careers. Women more frequently reported distress and impairment due to performance anxiety than men. Age was not found to affect problems with performance anxiety.
Shoup, D.	1995 *Medical Problems of Performing Artists, 10(3),* 100-105	425 high school and junior high school band and orchestra students were surveyed about performance-related problems. Non-randomized study.	Quantitative (survey).	33.2% indicated having a MS performance-related problem at some point since they began playing. Of these students, 51.9% reported the problem as current, yielding a prevalence of 19.6%. However, only 7.5% had missed rehearsals and only 12.5% had had to refrain from playing for more than one week. Consequently, most students reported a low severity grade for their problems. The most common treatment used was rest. 44.0% believed that they should continue playing while in pain („no pain, no gain“). About performance anxiety, 55.5% indicated having symptoms that negatively affected

				their performance (approximately the same proportion as in professional musicians). More than 18% admitted to severe nervousness with significant impact on their performance. 48.9% of the students complained of one or more non-MS problems that negatively affected their playing. The most common were asthma, eye strain, headaches, cold sores, and allergies.
Britsch, L.	2005 *Medical Problems of Performing Artists, 20(1),* 40-47	97 students in four youth orchestras in a midsized midwestern city (USA) were surveyed. Non-randomized study.	Qualitative (interviews).	Few reported accepting the belief of playing through pain, while performance anxiety was reported at a higher-than-expected rate. The older students had more awareness of possible causes of playing-related pain and strategies for its elimination than did the younger students. The older students also discussed their pain with teachers more frequently, receiving information that was beneficial in reducing or solving the problem. Two statistically significant relationships were found: one between amount of practice time and grade of pain reported in the youngest orchestra, and the other comparing females by age and grade of pain reported.

Fehm, L., & Schmidt, K.	2006 *Journal of anxiety disorders, 20(1),* 98-109	74 15-19-year-old pupils who attended a German special music school. Non-randomized study.	Quantitative (survey).	About one third of the group were distinctly handicapped by their performance anxiety. Unfavourable coping strategies, such as drug of alcohol abuse were rarely reported. Most pupils called for more support either from their teachers of from outside of school to cope with their anxiety.
Kenny, D. T. & Osborne, M. S.	2006 *Advances in Cognitive Psychology*, *2(2-3),* 103-112	381 young musicians aged 12 to 19 years attending secondary high schools. Somatic and Cognitive Features, Performance Context, and Performance Evaluation were investigated. Non-randomized study.	Quantitative (MPAI-A).	MPA was more specifically related to social anxiety than trait anxiety with stronger positive correlations between the MPAI-A and social phobia measures than MPAI-A and trait anxiety. The cognitive component of anxiety contributed to the prediction of music performance anxiety more than the somatic component. The experience of MPA may begin early in a musical career and the characteristics of this experience are qualitatively similar to those experienced by adult musicians.
Osborne, M. S. & Kenny, D. T.	2006 *Musicae Scientiae*, 1-17	23 adolescents with high MPA from a selective high school were randomly assigned to either a seven-session intervention program or a behaviour-exposure-only control group. The	Quantitative: self-reports of MPA, trait and state anxiety, diagnostic interview for social phobia, heart rate,	Significant improvements in self-reported MPA were observed at post-test for adherent students only (i.e., students who were actively engaged in the program and who adopted program techniques). Adherent students also had higher MPA at commencement. Non-adherent and behaviour-exposure-only students both

		intervention consisted of psycho-education, goal setting, cognitive restructuring, relaxation training and behavioural exposure in the form of two solo performances with audience. Randomized study.	frontalis EMG, and performance quality.	showed reductions in MPA over the study period but not to the same degree as adherent students. There appeared to be no effect of CBT on performance quality.
Osborne, M. S. & Kenny, D. T.	2008 *Psychology of Music*, 1-16	298 music students were asked to provide written descriptions of their worst performance, what happened and how they felt, specifying their age at that time, audience members, and any events that occurred subsequent to the performance. Non-randomized study.	Quantitative: Descriptions were scored according to six domains - situational and behavioural factors, affective, cognitive and somatic symptoms of anxiety, and outcome. Demographics, MPAI-A, and STAI-T were also used.	Both hypotheses were supported: first, that negative cognitions were more predictive of adolescent MPA than the behavioural, somatic or affective components of the sensitizing experience; second, that music students who reported a negative music performance experience self-reported higher levels of MPA than those who did not report such an experience. MPA was best predicted by trait anxiety and gender. Females reported more emotional distress than males and had significantly higher total scores.

Thomas, J.P. & Nettelbeck, T.	2014 *Psychology of Music*, 42(4), 624-634	90 secondary school music students Completed the Music Performance Anxiety Inventory for Adolescents (MPAI-A), State-Trait Anxiety Inventory, Junior Eysenck Personality Questionnaire Revised Short Form, and Adolescent Coping Scale Short Form. Non-randomized study.	Qualitative	Females reported significantly more MPA than males. Trait anxiety and neuroticism were significantly positively correlated with MPA and extraversion was significantly negatively correlated with MPA. Unproductive coping strategies were significantly positively correlated with MPA, but no significant association was found between MPA and productive coping strategies. Trait anxiety was the strongest significant predictor of MPA. Correlations between MPA with neuroticism and with extraversion were significantly accounted for by trait anxiety.

Wesner et al. found that poor concentration, rapid heart rate, tremor, sweating, and dry mouth were the most commonly reported anxious symptoms among their study population. Drug and alcohol use among this group of musicians was minimal. They concluded that performance anxiety is an important problem that may in some instances warrant medical treatment. The survey conducted by Shoup among a respectable number of high school music students showed that the proportion of students indicating symptoms of performance anxiety was approximately the same as in professional musicians, with more than 18% of the students admitting these symptoms to be severe enough to have a negative impact on their performance. The proportion of students that indicated having a musculoskeletal performance-related problem was lower than that of professional musicians (Fishbein et al., 1988; Raeburn et al., 2003). This may be due to the fact that professional musicians have usually spent more years practicing than young musicians and, consequently, their muscles are more affected. Alarmingly, approximately half of the student musicians who reported a MS problem believed that they should keep playing while in pain. Fortunately, the study conducted by Britsch among musicians playing at youth orchestras showed that few of them reported accepting the belief of playing through pain. This fact can be explained by greater maturity from age and experience, as Britsch also found that the older students were more aware of possible causes of playing-related pain and strategies for its elimination than the younger students. They also admitted discussing their pain with teachers more frequently, receiving information that was beneficial in reducing or solving the problem. Performance anxiety was also reported frequently. There was a relationship between the amount of practice time and the grade of pain reported, which supports the idea mentioned above that musculoskeletal problems are related to years of practice. The survey taken by Fehm et al. among a group of 15-19-year-old music students reported that about one third were handicapped by their performance anxiety, most of them calling for more support from their private teachers to cope with anxiety. Kenny et al. studied a large group of music students between 15 and 19 years old and found that MPA was more closely related to social anxiety than trait anxiety. They discovered that the cognitive component of anxiety contributed to the prediction of music performance anxiety more than the somatic component. They concluded that the experience of MPA may begin early in a musical career and the characteristics of this experience are qualitatively similar to those experienced by adult musicians. This last statement matches the study conducted by Ryan (1998) with children musicians. Osborne et al. (2006) selected a group of adolescent musicians