VOCAL, INSTRUMENTAL, AND ENSEMBLE LEARNING AND TEACHING

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Learning to play a musical instrument is a complex process, requiring the development of aural, cognitive, technical, musical, communication and performing skills (Hallam, 2006). Musical performance involves the integration of multimodal sensory and motor information and precise monitoring of the performance through auditory feedback (Altenmüller & Schneider, 2009), as well as the interaction of various memory systems (Chaffin et al., 2009). The excessive technical demands of performance, along with its highly competitive nature and public exposure, can lead to both psychological and physical stress in musicians (Vervainioti & Alexopoulos, 2015). The purpose of this chapter is to discuss psychological and physiological demands of learning to play a musical instrument and to propose ways of addressing them. Performance anxiety, one of the most common psychological problems experienced by musicians, is initially discussed. Physiological problems relating to sensorimotor and musculoskeletal functions are considered in the next section. The chapter then moves on to consider how musicians can address common psychological and physiological problems. Implications for teachers are also discussed, particularly concerning the assessment of students' susceptibility to performance anxiety and physical problems, as well as the development of critical skills in evaluating performance.

The Psychological Profile of Performers

The development of expertise in musical performance is a result of the interaction between biological and environmental factors (see Hallam and Bautista, chapter 8 for more details), but in order to achieve high levels of performance, musicians also need to maintain mental, physical, and psychological health. Professional performance is highly competitive and requires huge amounts of determination, integrity, and faith in one's potential. Musicians are constantly under the scrutiny of audiences and critics, which means that most musicians are likely to experience some form of rejection that can provoke insecurity at some point in the course of their careers. Considering the high demands of the music profession, it is perhaps not surprising that those who choose to become professional performers are usually devoted to music (Salmon & Meyer, 1998). They are often so committed to their craft that they can sometimes fail to separate their personal identity from their performance abilities (Kemp, 1996). Thus, professional musicians, and particularly students, tend to measure their self-esteem against how well they perform and their personal value against their performance competence (Dews & Williams, 1989; Kemp, 1996; Tobacyk & Downs, 1986). Identification of one's musical achievement with personal value can be positive for musicians with high self-esteem and who perceive themselves as being successful, but it can have negative effects for less confident musicians. It can lead to maladaptive behavior that is often observed in performers with lower self-esteem and negative self-perceptions, due to the presence of heightened apprehension, self-criticism, and perceptions of incompetence (Kemp, 1996). Such maladaptive behavior may characterize persons who view performances as threatening and who experience anxiety that has negative effects on performance. The excessive technical demands of performance, due to the highly competitive nature of the profession, can lead to psychological stress and physical stress as well. A number of physical and musculoskeletal impairments can occur as a result of the repetitive use of the same muscle groups or maintaining bad posture during long hours of practice and performance.

The following sections focus specifically on the aforementioned psychological and physiological demands of musical performance, and are followed by suggestions for addressing key issues.
The quality of performance at any given point is affected by the performer's level of expertise and adequacy of preparation, but can also be affected by psychological factors, such as self-perception, self-efficacy beliefs, and experience of performance anxiety. One of the most debilitating and frequently reported negative influences on musicians' development and on the quality of performance is musical performance anxiety (MPA). It can be defined as "a state of arousal and anxiety occurring before or while a person is performing non-anonymously in front of an audience producing a valuable or evaluated task touching on his/her self-esteem" (Kesselring, 2006, p. 309). As has been confirmed by many studies, MPA can negatively affect the quality of performance, especially in female musicians (Dews & Williams, 1989; Fishbein et al., 1988; Kenny & Osborne, 2006; Papageorgi, 2007a, 2007b, 2008; Rae & McCambridge, 2004; Ryan, 2004; Wesner et al., 1990; Isac & Dafiniou, 2012; Thomas & Nettelbeck, 2014) and less experienced musicians such as adolescents and undergraduates (Fehm & Schmidt, 2006; Papageorgi, 2009; Papageorgi, Creech, & Welch, 2013; Thomas & Nettelbeck, 2014; Patston & Osborne, 2015). Studies with professional and higher education student musicians have indicated that MPA is one of the most frequently reported problems (Williamson & Thomson, 2006), and it has been argued that MPA is a critical problem for 15-35% of musicians (Stetace, 2001). Recent studies have also identified comorbidity between MPA and other forms of psychopathology such as generalized anxiety, social anxiety, and depression (Osborne & Franklin, 2008; Andrade et al., 2013; Medeiros Barbar, de Souza Crippa & de Lima Osorio, 2014, Vaag, Bjorngaard, & Bjerkset, 2016).

Nevertheless, when anxiety is controlled and kept within reasonable levels, it can be beneficial. A number of studies have supported its adaptive effects, such as preparing the body for the demands of the forthcoming task, increasing motivation, improving concentration, and improving the quality of performance, particularly in experienced performers (Gates & Montalbo, 1987; Papageorgi, 2008, 2009; Papageorgi, Creech, & Welch, 2013; Hamann, 1982; Kemp, 1996, Larrouy-Maestri & Morsonne, 2014; Thomas & Nettelbeck, 2014). There is therefore a need to differentiate between maladaptive (or debilitating) and adaptive (or facilitating) forms of musical performance anxiety.

Conceptualization of Anxiety in Musical Performance

Theories explaining MPA conceptualize it as a multidimensional construct operating over time (Hallam, 1998; LeBlanc, 1994; Papageorgi, Hallam, & Welch, 2007). According to Kesselring (2006, p. 311), MPA is a form of social anxiety because performance in front of an unknown audience makes predictions of reactions (as the fulfillment of norms) difficult. Papageorgi et al. (2007) developed a conceptual framework that focuses on the performer through the various stages of performance preparation, enactment, and follow-up, showing in detail the processes that take place once a performer agrees to participate in a performance. Within this framework, MPA has been represented as a construct within a transactional model that suggests that the level of arousal depends on the interaction of (1) the performer's susceptibility to experiencing anxiety when the commitment to perform is made (which may include individual characteristics such as gender, age, trait anxiety, self-esteem, self-concept, and self-efficacy), (2) the performer's task efficacy (which relates to the process of preparation, learning approach, motivation to learn, task difficulty and value, and anxiety coping strategies), and (3) the characteristics of the specific environment in which the individual is expected to perform (which can be influenced by parameters such as audience presence, perceived degree of exposure, and venue characteristics).

Manifestations and Aetiology of MPA

Anxiety symptoms fall into three categories, namely cognitive, behavioral, and physiological (Lang et al., 1998). This three-factor model of anxiety states that anxiety arises from the interaction between three major components: a cognitive (or verbal) component (thoughts related to mental images of danger and threat), a behavioral component (inclination to keep or run away from everything perceived as dangerous), and a physiological component (bodily reactions to heightened arousal). Maladaptive MPA is accompanied by high levels of physiological arousal that result from the activation of the sympathetic division of the autonomic nervous system. This response is a result of the triggering of the "fight or flight" reflex of the human body, stimulated during anxiety or stress situations such as when a musician perceives a performance to be particularly challenging (Lehrer, 1987). This response was useful to our ancestors as a means to confront or escape physical danger, and was therefore evolutionarily adaptive for the preservation of the human species. During a "fight or flight" response, our body is programmed to utilize resources to optimize survival. The organs that are of most significance are the muscles, the heart, the lungs, and the brain, while the rest of the human body systems evidence reduction of operations. Blood flow is targeted to these areas to provide "fuel" in the form of oxygen to support the organism's innate survival instinct. While these responses were relevant for humans living in the wild and trying to avoid physical danger, they are irrelevant when a person is required to perform. The perception of physiological changes in the organism's homeostasis scares performers, especially if they are unaware of its aetiology, symptoms (manifestation), and effects. Changes to the physiological state of the organism include increase in heart rate and respiration, tension in all bodily muscles, "butterflies" in the stomach, dry mouth,
sweaty palms, cold hands, tremors, frequent urinary need, release of hormones such as adrenaline (epinephrine) and cortisol, and gastrointestinal disturbances (Gabrielson, 1999; Steptoe, 2001; Yoshie et al., 2009). Physiological responses to anxiety are also accompanied by behavioral indicators and effects on cognition. Behavioral indicators of anxiety include tremors, trembling and shaky hands, quivering voice, difficulty in moving naturally, moistening lips, and errors in performance (Gabrielson, 1999; Steptoe, 2001); the effects of anxiety on cognition can result in loss of concentration and attention, heightened distractibility, memory failure, maladaptive cognitions, and misreading of the musical score. These are some of the most common effects on cognition (Steptoe, 2001).

Coping with Anxiety in Musical Performance

The importance of devising appropriate coping strategies for dealing with the potential maladaptive effects of MPA should not be overlooked. If not dealt with appropriately, it can create significant problems by impairing the quality of performance and by impeding a musician’s ability to cope successfully with the demands of performance. Research (Papageorgi, 2008; Papageorgi et al., 2010) emphasizes the importance of musicians developing anxiety coping skills.

Musicians tend to utilize strategies distinguished as "emotion focused" and "problem focused" (Papageorgi, 2008). Similar categorizations have been reported by Wolfe (1990), as well as by Folkman and Lazarus (1980) in general anxiety research. Emotion-focused strategies concentrate on alleviating/moderating distressing emotions (e.g. specialized techniques such as hypnotherapy, meditation or neurolinguistic programming, taking medication, avoiding performance, maintaining a positive attitude to the performance, etc.). Problem-focused strategies concentrate on finding ways to cope with the demands of performance and deal with the negative effects of anxiety (e.g. practicing, rehearsing mentally, warming up, exercising, and eating healthily). Other coping strategies reported in MPA literature include relevant terms such as task-oriented coping, emotion-oriented coping, and avoidance-oriented coping (Endler & Parker, 1990; Kobori, Yoshie, Kudo, & Ohnuki, 2011).

Young musicians also report using a variety of coping strategies for dealing with the demands of performance. Figure 12.1 shows the responses given by 410 adolescent musicians in a self-report questionnaire dealing with various learning and performance issues, when asked what (if any) strategies they use to deal effectively with performance anxiety.

The reported strategies relate closely to the emotion-focused and problem-focused strategies reported by adult musicians in other studies (e.g., Sinico & Winter, 2013). This demonstrates that MPA is also an issue for younger musicians and suggests that devising appropriate strategies to deal with performance anxiety is imperative in order to avoid problems in the future.

In a more recent meta-analysis by Goren (2015), the efficacy of various types of nonpharmacological therapies for MPA has been analyzed. Based on a sample of 29 studies (total N = 852), an average medium-effect size (Hedges’ g which is comparable to Cohen’s d) of 0.64 (95% CI = 0.25, 1.03) was found. Subgroup analyses revealed that combined (cognitive-behavioral) therapeutic approaches showed a higher effect (Hedges’ g = 0.73) when compared to behavioral interventions (Hedges’ g = 0.57) or complementary and alternative methods (e.g., yoga or biofeedback; Hedges’ g = 0.67).

From a historical perspective, we can observe a continuous increase of sensorimotor demands on the performance of rehearsed music over the past 200 years.
As Lehmann (2006) argues, this historical trend seems to be unbroken. The consequence of this increase in sensorimotor demands is an increasing need for musicians to consider the conditions of sensorimotor skill acquisition and health maintenance.

Physiological Prerequisites of Instrumental Choice

At the beginning of a successful instrumental education, the student has to choose his or her instrument (see Hallam and Bautista, chapter 8). The ideal case would be that high individual motivation to learn a particular instrument met the instrument’s physiological prerequisites (for the special demands of voice health, see Nix and Roy, chapter 6). However, detailed information on biomechanical norms for selected instruments is rare. Based on an extensive collection of biomechanic data from musicians, Wagner (2005) showed that the left forearm of violin players is characterized by a high degree of left-hand supination (easy turn of the hand to and fro) which can be achieved with little effort. In addition to the degree of forearm rotation, the second biomechanical aspect of hand flexibility is movement facility. This means that not only the maximum degree of possible forearm rotation but also the force needed to reach the maximum rotation angle are relevant for violin playing. Although it seems reasonable to base the recommendation for a particular instrument on simple hand movement norms, Wagner (2005) emphasizes the wide range of observable variation in hand parameters in musicians. However, as long as there are only post hoc measurements and no longitudinal studies on the influence of biomechanical factors on instrumental success, recommendations for an instrument based on hand movement norms have a weak basis.

Against the background of general processes of physiological adaptation, it is hard to answer the "chicken-and-egg" question of what comes first—the biomechanical requirements or the successful instrumental learning. This means that physiological criteria may be helpful as additional aspects of instrument choice; for example, students with small hands will have difficulties playing the viola or violoncello, and students with irregular tooth positions will have difficulties in learning a brass instrument. However, with the current state of research, it seems to be more reasonable to rely on the common sense of experienced music educators and their intuitive knowledge when parents ask for advice on the choice of instrument for their child. Furthermore, smart strategies of adaptation in terms of repertoire can allow for successful instrumental learning despite seemingly disadvantageous biomechanical requirements. To keep the balance between the necessary physiological requirements and the child’s emotional attraction to an instrument remains a challenge for the experienced instrumental teacher.
be observed in the amount of practice needed for skill maintenance at the piano. Subjects with an average practice time of about two hours kept regularity of scale playing just as well as subjects with a practice time of about five hours. This large variance can be explained by other factors than the mere quantitative element of practicing. For example, the quality of practice in terms of deliberate practice could account for these differences (see Lehmann and Jørgensen, chapter 9, for details).

Health Promotion

High demands on the musculoskeletal and nervous system of musicians and competence in health maintenance should be taken seriously by all musicians. However, as Kreutz et al. (2009) found in a survey of music students, awareness of the importance of health responsibility was minimal. Only moderate engagement in health-promoting behavior was observed (e.g., lack of physical activity). In a more recent study (Spahn et al., 2017), the validity of this finding was verified based on a nationwide sample of music students. Results showed that although about 70% of the music students participated in preventive health behavior during their university education, students with no playing-related health problems did not engage in preventive activities. Those with low-level or high-level playing-related health problems exercised preventive activities or took medicine. Against this background, instrumental tutors, in particular, have the responsibility for their students and should give advice on health matters related to playing. However, as emphasized by Spahn et al. (2017), the acceptance of preventive courses and the transfer of learned strategies to daily life and practice remains a task for future activities. Recommendations for healthy practicing can also be derived from biographies of historical musicians. For example, to avoid physical and mental exhaustion, Clara Wieck-Schumann was not allowed to practice more than three hours per day as a child. Her father and piano teacher, Friedrich Wieck, attached great importance to regular physical exercises of the hands (e.g., finger stretching) and to general physical endurance (e.g., walking for hours, see Altenmüller & Kopiez, 2010).

A special occupational health risk in professional musicians is loss of motor control. Musician’s cramp (focal dystonia) is a prominent example of this domain-specific movement disorder (Jabusch & Altenmüller, 2006). According to estimates, about 1% (with a male-to-female ratio of 4:1) of all musicians are affected with this disorder. Pathophysiologic findings have revealed that a perfectionist attitude and anxiety influence this disorder (Jabusch & Altenmüller, 2004). Based on the current state of research, focal dystonia seems to be the result of maladaptation in neuroplasticity with currently only little probability of a complete cure.

Suggestions for Coping with Musical Performance Anxiety

Appropriate preparation (technical and psychological) and the development of coping strategies can help in ensuring that performers are not affected maladaptively by performance anxiety but benefit from the adaptive properties that preperformance arousal can have. Such strategies need to focus on maintaining a positive attitude toward performance and on reducing a focus on high stakes elements. According to Lehmann et al. (2007), MPA consists of three sources: physiological arousal, cognitive anxiety, and the task itself. Thus, coping strategies should consider these factors. For example, physiological arousal can be controlled by the acquisition of relaxation strategies; cognitive anxiety can be reduced by positive self-statements ("I am well prepared") and the interruption of negative ruminations; the anxiety-inducing potential of the task itself can be reduced by an adequate choice of pieces; choosing
repertoire that realistically matches the performer's skill level (and is adequate for public performance and not just for practicing) will help to control for this source of anxiety.

An interesting approach to MPA comes from research in social anxiety disorders: Rapee and Heinberg (1997) found that people with social phobias are characterized by a bias in the processing of social evaluative information. Pre-event, real-time, and post-event negative ruminations play a central role in the generation of social anxiety. These ruminations can lead to heightened anxiety in social situations. The authors' proposal for therapeutic treatment includes the redirection of attentional resources away from negative self-evaluation and evaluation by the audience and toward the development of a realistic mental representation of how the audience sees the individual. In another study on social anxiety disorder, Abott and Rapee (2004) developed a post-event rumination questionnaire. People with heightened social anxiety showed an increased score one week after a public speech. The role of negative post-event ruminations has been investigated in musicians (Gorges & Alpers, 2009). The authors observed a correlation between negative ruminations over a concert video recording (e.g., worry about mistakes) and cognitive symptoms of MPA. Against this background, a strategy for coping with MPA could also include the interruption of negative ruminations.

Finally, more recent approaches try to use performance simulation for the development of coping strategies (Williamon, Aufegger, & Eiholzer, 2014; Aufegger, Perkins, Wasley, & Williamon, 2016). First findings showed that effective training depends on the subject's exposure to the real-world performance setting in the simulator. Practical suggestions for dealing with the psychological demands of performance and overcoming performance anxiety are offered as follows:

Step 1: Increase awareness.

- Understand the aetiology and manifestation of MPA.
- Understand the sources of the physiological changes occurring in the body.
- Differentiate between adaptive and maladaptive musical performance anxiety.
- Reconceptualize the potential effects of musical performance anxiety and focus on the positive effects. It can prepare the body to deal with the task and can increase alertness and concentration.
- Understand that musical performance anxiety is a normal response that even seasoned performers experience.

Step 2: Prepare mentally—visualize a successful performance.

- Maintain a realistic outlook on the performance.
- Be confident and believe that you will do well (positive outcome expectancies).
- Employ mental imagery to visualize yourself during the performance and envisage doing very well.

Suggestions for Practicing and Health Maintenance

Professional musicians are confronted with numerous factors increasing occupational stress: exposure to noise working unusual hours, bad lighting and air conditions, and traveling. Thus, a sufficient knowledge of how to maintain health and skills should be developed at an early stage of instrumental education for all musicians. According to recommendations given by music-medicine specialists (Altenmüller, 2006; Hildebrandt, 2006), guidelines for healthy practicing should include the following three main areas.

- General practice strategies: development of efficient time management for performance preparation, verbalization of clear aims for a practice session, training to be successful at the first attempt, development of movement anchor points (e.g., orientation or starting points for difficult sections), training of entire action patterns instead of isolated movements, training of movement variations to increase flexibility of movement patterns, weekly stage training in front of colleagues.

- Physiological strategies: only complete a single-digit number of repetitions, observation of skill increase and avoidance of overoptimization, avoidance of coordinative exhaustion through regular breaks while practicing (rule of thumb: short break after 45 minutes, longer break after 120 minutes), allowing sufficient time for physiological recovery between the end of the practice phase and public performance, development of stable mental representations of movement patterns (e.g., by mental practice methods and practice in different playing positions).

- Health promotion: the application of health-promoting techniques (gymnastics, muscular relaxation), prevention of musculoskeletal overuse symptoms by regular breaks (e.g., warm-up exercises before and after practicing), development of a good physical condition and stress resistance (e.g., endurance training), distributed, as opposed to concentrated, practicing.
Teachers can assess the extent to which performance anxiety might be a problem either through discussions with the student or by using specially devised assessment scales during the lesson. For assessing students' susceptibility to experiencing performance anxiety, one exemplar scale is the Adolescent Musicians' Performance Anxiety Scale (AMPAS; Papageorgi, 2007b), shown in text box 12.1.

For assessing how at risk musicians are for experiencing physical problems, one exemplar scale is the "Are You at Risk" scale (adapted from Llobet & Odam, 2007), shown in text box 12.2.

Such assessments can be very useful in identifying each student's predispositions and can assist teachers in devising teaching approaches tailored to suit each student's dispositions and needs. In addition to identifying individual student needs, teachers should provide constructive feedback to young musicians so that positive identity development and self-confidence are promoted, and their motivation for engaging with music is not jeopardized. Teachers should try to maintain students' interest and intrinsic motivation and help them maintain a healthy and balanced approach to performance by stressing that each performance is a learning experience. At a practical level, teachers need to ensure that students are familiarized with the performance venue prior to the event, so they will be psychologically prepared for what to expect, and also to practice performing itself. Teachers also need to emphasize the importance of musical communication and the audience's enjoyment of the performance.

Supporting the Development of Critical Skills in Evaluating Performance

The ability to play a musical instrument is one of the most highly valued skills for musicians. As a result, the assessment of musical performance features prominently within music curricula at all levels of expertise. Exam boards and music programs need to conduct objective performance assessments in order to be able to compare different musicians and award graded examination results and performance degrees. For this reason, different assessment methods are employed to achieve objectivity in performance assessment. Such methods usually involve establishing criteria for the most valued constructs in performance, such as phrasing, balance, articulation, rubato, and dynamic range, and require adjudicators to dissect the various components and evaluate them separately (McPherson & Thompson, 1998; Thompson, 2009). Objectivity can be increased by determining clear criteria against which performances are evaluated and the employment of rating scales so that adjudicators can indicate the extent to which a performer meets them (Boyle, 1992). Multidimensional assessment rubrics have also been used to assess instrumental and vocal performance at university level (e.g., Ciorba & Smith, 2009).

Assessment can provide important feedback to students and teachers regarding instructional objectives, and undoubtedly has many educational benefits (Stanley et al., 2002). At the same time, the ways evaluation practices and assessment procedures are articulated in educational and professional settings can be a source of psychological and physiological problems, such as MPA. The excessive technical demands of performance due to its highly competitive nature also increases pressure. To further complicate the matter, a performer's perception of the quality of her performance immediately after its completion can be inaccurate or not completely objective due to a range of external factors. It can also be influenced by basic self-image (Gordon, 2006).

It is important for learners to develop critical skills to be able to objectively reflect on and evaluate their work so that they are able to identify areas for improvement, but also recognize their achievements. Using video recordings as a learning tool provides learners with an audience perspective on their work and can be highly valuable (Hallam, 2006). Educators increasingly incorporate this methodology in their teaching as a means to engage students in self-reflection and self-assessment and raise students' critical awareness (Lynch, 1998; Benson, 2000). In a study investigating the effectiveness of introducing this method, almost half of the students surveyed stated that seeing the video helped them identify their errors more clearly than at the time of performance (Daniel, 2001). Perceived advantages reported by the students included (1) pinpointing areas of difficulty and then trying to address them, and (2) assessing themselves from an audience point of view and seeing how they reacted in the performance arena. Some students noted, however,
Text Box 12.1: The Adolescent Musicians’ Performance Anxiety Scale (AMPAS)

Read each of the following statements carefully and then circle the appropriate number to indicate the degree of frequency that you experience or do certain things.

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<th>Always</th>
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<th>Rarely</th>
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<td><strong>1.</strong> Prior to an important performance (exam, audition, concert) I find myself thinking: &quot;I can do this. I have studied hard and I am going to do well.&quot;</td>
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<td>4</td>
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<td><strong>2.</strong> I feel confident when I perform in front of other people.</td>
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<td><strong>3.</strong> I worry a lot for several days before I take a recital examination in front of a jury.</td>
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<td><strong>4.</strong> During recitals I get so nervous that I have a mental block.</td>
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<td><strong>5.</strong> Sometimes, especially if I score low in an exam or audition, I do not tell anyone exactly what my score was.</td>
<td>5</td>
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<td><strong>6.</strong> I believe that anxiety is not bad for my performance.</td>
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<td><strong>7.</strong> I believe that anxiety is bad for my performance.</td>
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8. Sometimes, before an important performance (exam, audition or concert) I find myself thinking: "This is too difficult. I am not going to do well", even though I may have worked really hard in preparing for that event.

9. I feel relaxed when I perform in front of other people.

10. Just before an exam, audition or concert I feel very anxious, worry that things will go wrong and wish this was already over.

11. During recitals and exams my heart beats very fast.

12. Sometimes, especially if I score high in an exam or audition, I do not tell anyone exactly what my score was.

13. I believe that anxiety makes me feel alert and eventually has a positive result on my performance.
14. I believe that anxiety makes me forget parts of the music, makes it difficult to concentrate on my playing, and eventually has a negative result on my performance.  
15. I like recitals because they are opportunities to show to others the hard work I have been doing.  
16. During recitals / exams my hands are cold.  
17. Just before I get feedback on my performance or expect to hear the results of an exam, I get anxious and jittery.  
18. During my recitals I feel great.  
19. During recitals / exams my hands sweat.  
20. I enjoy my recitals because I can share my music with others.

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Text Box 12.2 The "Are you at Risk" scale

Please read each of the following questions carefully and then circle the appropriate number to indicate the degree of frequency that you experience or do certain things.

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<td>7. Do you perform physical exercise more than once a week?</td>
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<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8. Do you sleep for less than eight hours a day?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9. Are you a perfectionist?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>10. Do you find it difficult to say 'no' to a musical project?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>11. Are you usually under a lot of pressure?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>12. Do you choose your repertoire with regard to your physical, technical and psychological abilities?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>13. Do you regularly review your posture in front of a mirror or through being filmed?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

that video recording can make performers more nervous and that the quality of sound can sometimes be poor (Daniel, 2001).

The use of video recordings for self-assessment is clearly an invaluable tool for educators and learners alike. In addition, it can also be useful in formal assessment processes to increase the objectivity of evaluation. Video-recorded performances can be observed and independently evaluated by two or more judges. Interrater agreement can be assessed, and upward or downward adjustments can be made in cases of discrepancies in assessment grades, on the basis of approved guidelines.

**Conclusion**

Learning to play a musical instrument is a demanding activity. The development of expertise in musical performance, like that of other skills, is a process that takes place over a long period of time, and requires a considerable amount of practice. Performance usually takes place in a public context; it is almost always directly or indirectly evaluated by an audience; and it is assessed in real time. These conditions place considerable psychological and physiological demands on musicians, who need to be physically, emotionally, and mentally fit to achieve in such a highly competitive field. For a better understanding of the special living conditions of professional musicians, modern documentaries can be helpful. For example, *Trip to Asia* (Dirks et al., 2008), the documentary on a concert journey of the Berlin Philharmonic, gives an unadorned insight into the daily high demands on outstanding orchestral musicians.

Employing appropriate strategies can assist musicians in dealing individually with the psychological and physiological demands of performance. At the same time, it is important to acknowledge that performance expertise is more likely to develop in a learning environment that supports the development of "communities of practice" and encourages peer support between musicians. Furthermore, institutions should offer programs informing musicians of the psychological and physiological demands of musical performance and how to cope with potential problems. They should also openly encourage and foster the development of supportive learning communities to facilitate the development of well-rounded musicians who are able to reach their full potential.

**Reflective Questions**

1. How can performing musicians maintain their motivation in the face of the increasing psychological and physiological demands of performance?
2. Do all musicians respond to the demands of performance in the same way?
3. What are the most important recommendations for health maintenance and the avoidance of overuse symptoms?
4. What is/should be the role of educational institutions responsible for training performing musicians in preparing them for the demands of their chosen profession?
KEY SOURCES


REFERENCES


