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Teaching Students about Performance Anxiety

The Scratch Pad Pop-Up Model

Abstract: Performance anxiety is a common problem for many students and an issue that educators often address. This article examines a model of performance anxiety based on working memory and attentional processes. The model is described in a way that is easily understood by students of all ages. It is then used to classify methods of reducing performance anxiety and explaining how they work. Practical exercises for helping students understand performance anxiety and cope with it are presented.

Keywords: adjudication, anxiety, contest, performance, practice, rehearsal, teaching

Music educators spend much of their time helping students prepare for performances, and good performances are rewarding for everyone—the student, the educator, and the audience. While much of the preparation is related to technique and interpretation, it is also important to help students manage the anxiety that often accompanies performance. This article presents an easy-to-understand (and easy-to-communicate) model of music performance anxiety (MPA). We also describe several methods for handling MPA and how they are related to our model.

A Model of Music Performance Anxiety

Whether it is being a little nervous or too terrified to move, most people who experience MPA think there is something drastically wrong with them. In fact, MPA is quite common among students and professionals. Recognizing that one is not alone in one’s suffering and becoming knowledgeable about what is happening are the first steps to combat the problem. With that in mind, we have developed a research-based model that we think even the youngest students can understand. Our model uses two metaphors: “scratch pad” for working memory and “pop-ups” for intrusive thoughts.

Any complex behavior, such as playing a musical instrument, requires accessing task-relevant information and monitoring its application. For example, to play a short passage on the trumpet, one must recognize the written notes, recall what valves must be depressed, control inhalation and exhalation, identify rhythms, consider various articulations, listen to others, look ahead to what the next notes are, and so on. Knowing what to do and keeping track of the entire process occurs in what psychologists call “working memory” (WM).2

WM has several properties: first, the amount of active information in WM is limited. Second, the content of WM is dynamic.
Attentional focus changes over time, continuously accessing information required for task performance. Third, and most important for our model, all conscious thoughts use WM resources and may interfere with executing task-relevant instructions. Each of these properties reveals processes that influence performance.

For any skilled performance, there are many competing demands on WM that can easily exceed its limited capacity. Experts solve problems by creating special memory structures that make fewer demands on WM, can be rapidly accessed, and are executed almost automatically. For example, experienced musicians often recognize and play patterns rather than individual notes. An instruction such as “chromatic from F to B and back” is much more efficient and automatic than “F, F-sharp, G, G-sharp, A, A-sharp, B, B-flat, A, A-flat, G, G-flat, F.” In fact, there is substantial literature that suggests that recognition of these types of patterns and using them to control behavior is one of the defining features of expertise.

The second property of WM, that it is dynamic, emphasizes the fact that the content of WM is constantly changing. It is impossible to be consciously aware of all the requirements for playing a particular piece. Rather, attention should flexibly shift as the demands of playing the music change. Dwelling on how poorly (or how well!) one just played interferes with efficient functioning of WM, which can cause a poor performance.

Finally, fear often produces the kind of conscious thoughts that interfere with and disrupt efficient operation of WM. In some respects, this is a good thing, because fear is usually a danger signal, a sign that one might be harmed. When someone detects signs of danger, his or her body mobilizes all its physiological and cognitive resources to fight or run away because survival may be at stake (the fight-flight reaction). Everything else must stop until the threat is eliminated.

Being exquisitely sensitive to signs of danger is very important for survival, so people have a system that automatically detects signs of danger. The threat evaluation system (TES) is responsible for monitoring threats and automatically sending messages to WM. If one were to decode a message about an impending threat, it would be something like “Stop everything now—you might be in mortal danger.” If one is really in danger, such a thought is beneficial and may lead one to act in a way that avoids harm. On the other hand, if the fear is based purely on psychological factors (“I might fail,” “My friends may laugh at me,” etc.), there is nothing to avoid, and the thought (and the physiological reaction) is itself harmful. The TES, then, sends messages to WM about impending harm and increases physiological arousal (e.g., heart rate increases, breathing becomes rapid and shallow, perspiration increases, trembling or shaking). Although the TES is always on guard, it is more sensitive to threats if the individual is at a high level of physiological arousal.

When the TES is activated by a potential threat or fear, a circular process is set in motion. Simply put, when someone is frightened, he or she becomes more physiologically aroused and aware of anything that could be construed as a threat. Being “on guard” requires the active monitoring of resources of WM. Because WM is involved in monitoring threat, it may interfere with ongoing behavior. If the thing that a person is frightened about is performing poorly, then the behavioral disruption will increase the fear, which will increase arousal, which will disrupt behavior, and so on. That process is the downward spiral or cycle that we want to stop. But before getting to possible interventions, let us describe how these concepts can be explained to students.

Explaining the Model to Students

Our explanation of the model relies on the mental scratch pad and pop-up metaphors. Depending on the age of the students, we may include some of the more technical materials presented in the previous section. Regardless of the specific content, there are three steps we follow to explain the model.

Step 1. Present the scratch pad concept. Have students think about all they have to remember to be able to play (or sing) a short passage. It may help to have them think about what instructions they would give to tell someone else. To illustrate the scratch pad concept, draw a rectangle on the board, ask for a volunteer to give you instructions, and write them in the rectangle. Even with beginning students, it is easy to see that there is a lot to keep track of, and you may even run out of space. Tell students that we have a mental scratch pad and that almost everything we do and think is “written” on it. Figure 1 is an example of a scratch pad.

Step 2. How the scratch pad works. The next step is to point out that the scratch pad is not very big, and if there is too much written on it, we may not understand any of it. One way to handle the problem is to erase information that is no longer needed. This can be illustrated by erasing some of the instructions you have just written, for example, the finger- ing for a specific note. Then mention that after a task is finished, such as playing a note, the instructions for it will automatically disappear unless, of course, one consciously pays attention to it.

Step 3. Pop-ups. Ask students if they know what a computer pop-up is (most do), and discuss how annoying pop-ups are. When there is a pop-up, it is difficult to keep doing what one was doing before. Pop-ups appear on the scratch

**FIGURE 1**

The scratch pad
pad, take up space, are very annoying, and make it hard to see the other information. Although they will eventually disappear on their own, if we pay attention to them, they will not go away. An example of a pop-up is thinking about a mistake one just made or what a friend in the audience is doing. Ask students to give examples of pop-ups. Most students will be able to give examples from music performances, but if they have difficulty, ask for examples from sports or other activities. This helps students understand the concept of pop-ups. Also, it is often comforting to discover that other people struggle with negative thoughts.

The Interventions

Teaching students the model allows us to use the scratch pad and pop-up concepts to explain what to do to reduce MPA. Our approach does not add new techniques but, rather, provides a way to organize and understand how they work. We classify interventions based on what we call the max-min principle. The principle states that there are two primary ways to reduce MPA: (1) maximize scratch pad efficiency and (2) minimize the frequency and influence of pop-ups.

There are two classes of interventions that make the scratch pad more efficient. The first focuses on preparation and the second on increasing focal attention.

Preparation

Everyone recognizes the importance of preparation, although how one prepares can make a great difference. From our perspective, the purpose of preparation is to create “shortcuts” much like the short-cut icons on a computer desktop. Computer shortcuts save keystrokes—just click on the icon and a series of steps are performed. Rather than having to remember each step, one needs only one click. There are two kinds of shortcuts—one group for increasing expertise and another for managing a specific performance.

We think that much of the improvement in musical technique is a result of creating effective shortcuts. These automatic sequences of thoughts and actions are created through what Ericsson and others call deliberate practice. The resulting patterns of complex motor actions (for example, the fingering sequence for a major scale) become more or less automatic, require little conscious attention, and take up little space on the scratch pad.

Expertise shortcuts are like building blocks. Performance shortcuts combine the blocks to make a unique structure. It is most effective to focus on transitions. Although the shortcuts can be mental (e.g., thinking “remember the key change”), less scratch pad space will be consumed if external cues are used. For example, almost every teacher has encouraged students to mark their music at critical points, such as where accidentals appear and the location of key or tempo changes. These marks can include, for example, circling the accidental or drawing eyeglasses above an unusual rhythm. Another approach is to use different colored sticky notes as cues for some aspect of playing. A small yellow square stuck to music could remind the student to take a full breath.

Another aspect of performance-specific preparation is aimed at reducing uncertainty and solving problems before the performance. The process of resolving uncertainty and solving problems takes up scratch pad space. For example, if at all possible, have students play in the performance venue, rehearse the music in performance order, or require your students to assume a “ready position” every time you step on the podium.

Focal Attention

There are two attentional processes that need to be cultivated: (1) pay attention to the music and (2) do not pay too much attention to pop-ups. The problem with pop-ups is that they are designed to grab attention (“Do something quick, or you’ll suffer!”). The question is what to do when those negative thoughts pop up. One way psychologists have addressed this question is by studying the relationship between unwanted images and attention. In a series of clever studies, people were told not to think about a white bear. The results were that attempts to suppress the image of a white bear were not only unsuccessful but in fact made people more likely to think about white bears. The implication is that trying to suppress negative thoughts may be counterproductive.

Fighting negative thoughts (e.g., “Stop worrying about messing up”) in fact takes up space on the scratch pad and interferes with performance. So, when negative thoughts occur (and they will), notice them and then let them “slide away.” This process has been called “developing a Teflon mind.”

One way to develop this style of thinking is by practicing mindfulness exercises. Mindfulness is an approach to stress management that relies on training attention. The exercise can be done in a group, takes about five minutes, and almost always has an immediate calming effect. Essentially, students are asked to pay attention to their breathing by counting breaths from one to ten and then starting over (Figure 2 gives step-by-step instructions). Students are told that they will notice many thoughts and that when they do, they should simply refocus attention on their breathing. Perhaps the most important thing to remember is that one should not try to stop thinking. Like the white bear, the harder one tries to stop thinking, the more one will think. Thinking about not thinking is thinking.

With regular practice, once or twice a day for ten to fifteen minutes, most people find that they become more proficient at clearing their mind (erasing the scratch pad) and becoming more focused. After the skill is developed, the mindfulness state can be initiated with two or three cleansing breaths. Immediately before a performance, having students take two or three cleansing breaths can ready them for paying full attention.

Minimizing Pop-ups

Another group of techniques is designed to reduce pop-up frequency. Even if one could, one should not eliminate pop-ups, because part of being human is the capacity to recognize and respond to
threats; that is what the TES does. We do not want to eliminate the TES; rather, we want it to be more selective about when it responds and what it responds to.

Arousal Reduction

Arousal level is one factor that influences when the TES responds. Here, arousal refers to generalized physiological arousal mediated by the sympathetic nervous system or, put in less technical terms, being on edge or excitable. The higher the arousal level, the more likely it is that insignificant events will trigger a TES response and generate a pop-up. One way to explain this to students is to discuss how horror movies make use of this psychological process. Tension is built (often through the use of music) and an event that is normally insignificant, such as a telephone ringing, produces a strong startle response and fear.

Ringing telephones are much more frightening if one is on edge. The higher the arousal level, the more likely it is that insignificant events will trigger a TES response and generate a pop-up. One way to explain this to students is to discuss how horror movies make use of this psychological process. Tension is built (often through the use of music) and an event that is normally insignificant, such as a telephone ringing, produces a strong startle response and fear.

One easy-to-learn method of reducing arousal level and tension is based on progressive muscle relaxation. The first step is to learn to identify sources of tension. This can be accomplished by first tensing and then relaxing specific muscle groups. A muscle group is tensed for about three seconds and then relaxed. Figure 3 gives an example of the instructions for a group relaxation exercise. Part of the idea is that people are often unaware of tense muscles and so unknowingly maintain high levels of arousal. Tensing and relaxing muscles increases awareness of tension and promotes relaxation. Because one is more aware, it is possible to do a “tension scan” in which one checks different muscle groups, looking for tension and relaxing those muscles when they are tense. Many people find that tension is usually located in some muscle groups (e.g., the shoulders) and not others (the legs). With this knowledge, one can check that muscle group first, and often, relaxing those muscles has an overall effect. The scan-and-relax technique can become part of a preperformance routine.

This process is often streamlined by pairing relaxation with visual images or suggestions of warmth and heaviness. The images or suggestions then can elicit relaxation by themselves. Sometimes, usually with the help of a professional, people make recordings of the relaxation protocol so they can play it before a performance. Regardless of the specific technique, the goal is to reduce arousal and muscle tension so that the TES is less sensitive. There is one caution. It is possible to become too relaxed before a performance, so use the extended group session to teach the skills and the brief scan-and-relax exercise before a performance.

FIGURE 2
Mindfulness/breathing exercise

Instructions
- Say, “We’re going to do a quick exercise that will help you to focus your attention. It will take about three minutes. All I want you to do is to count your breaths from one to ten and then start over again. Pay attention to your breathing. When you notice you are thinking about something other than your breath, just return to paying attention to your breathing. Don’t try to not think. Just count your breaths.”

Posture
- Have students seated on the edge of their chair with their backs straight.
- Heads should be tilted down at about a forty-five-degree angle.
- Eyes should be open and focused on a spot on the floor about two or three feet in front.
- Hands can be placed on the knees.

Breathing
- Breaths should be through the nose.
- Breathe slowly and count at the end of exhalation.
- It is helpful to model counting a breath or two so students get the idea.

Procedure
- Model the posture and procedure by doing the exercise along with the students.
- Count your breaths from one to ten and repeat it once or twice. If you repeat once, the exercise will last three to four minutes.
- When you are finished, tell the students to stop counting.
- There is no need for extended discussion about the exercise. Simply continue with whatever comes next.

FIGURE 3
Shoulder/neck muscle relaxation

Progressive muscle relaxation is an extended procedure that focuses on several muscle groups. The following illustrates the procedure for shoulder muscles. For more detailed protocols, see Jonathan C. Smith, ABC Relaxation Training (New York: Springer Publishing, 1999).

Introduction
- Say, “Sometimes people are tense and don’t even recognize it. This exercise is designed to help you notice the difference between tension and relaxation. I will ask you to tense and then relax certain muscles. Just listen and do what I say.”

Posture
- Seated in a comfortable chair.
- Feet on floor.
- Eyes closed.
- Hands and arms resting on chair arms or lap.

General Guidelines for Teacher
- Do not talk too fast! This is a common mistake and is counterproductive.
- Be sure to insert pauses; looking at a clock or watch helps.
- Change voice quality slightly for “tension” and “relax” instructions.

Shoulders Instructions
- “Now focus on your neck and shoulders.” (pause for two seconds)
- “Try to pull your shoulders up to your ears, like a turtle.” (two seconds)
- “Hold it tight.” (two seconds)
- “Now relax.” (four seconds)
- “Feel the muscles become limp.” (four seconds)
- “No tension; just smoothness.” (four seconds)
- “Let all the tension flow out.” (four seconds)
- Repeat the tense/relax cycle of instructions.

Cognitive Restructuring

People are frightened by the ringing telephone in a horror movie in part because of heightened arousal. But usually there is a second factor, an assumption that the telephone call is from the murderer (ghost, zombie, etc.). If one does not
assume that the telephone call is from the villain, then the fear pop-up is less likely to occur. Assumptions people make about music performance are influential because they often determine what constitutes a threat.

Some assumptions are simply wrong and lead to irrational expectations. For example, assuming a performance should be perfect leads to an irrational expectation that is almost guaranteed to be violated. Similarly, expecting not to be nervous also is probably irrational. When irrational expectations are identified, they should be rebutted. For example, if students expect a perfect performance, ask them to think back to how many times they performed the piece perfectly in rehearsal. If perfect performance during rehearsal is not routine, why should one expect that the performance will be perfect? We do not discourage positive expectations, but it is probably better to expect a few mistakes and some jitters rather than anticipate serene perfection.

Many people find it useful to examine goals as well, because goals often determine what people perceive as a threat. Goals fall into three groups: performance goals, avoidance goals, and mastery goals. Performance goals focus on a particular outcome; avoidance goals focus on eliminating distress associated with a task; mastery goals entail performing as well as one can. Research has shown that people who adopt mastery goals experience the lowest levels of performance anxiety. How goals are related to levels of performance is a broad topic and cannot be covered here. Suffice it to say that one important step in determining threat is to examine what one’s goals are and, as much as possible, substitute mastery goals for performance and avoidance goals.

**Meeting the Challenge**

We think the scratch pad pop-up model of music performance anxiety is relatively easy to understand and explain. It can be used to address a wide range of performance-related issues and will give students (and teachers) accurate information to meet the challenges of performance.

**Notes**


