Finding focus : using external focus of attention for practicing and performing music

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Audiation and Musical Imagery

Introduction

As explained and illustrated at the end of the preceding chapter, there are many ways one could interpret external focus for learning and performing music. This chapter will present and justify the idea of using audiation as a form of external focus for the purposes of the experiment design in this study. Audiation is, for the purpose of the current thesis, defined as including anticipatory auditory imagery (imagining the sound that you are about to produce), and involves exploring the meaning and expression of the music through singing, physical gesture and making variation. Mechanisms behind and explanations of each of these elements will be described.

Audiation: Music as Language

Making music is not only motor control but also involves expression. Optimal results for a musician include that a performance is convincing not only technically, but also that something is communicated to the listener, including: beauty, motion, expressive form, energy, tension, events, religious faith, personal identity or social conditions (Juslin, 2001; Juslin & Persson, 2002). Between around 1600 and 1800 music was approached in a rhetorical way, where a trained musician would consciously use the same kinds of rhetorical devices as an orator to convince and to move the audience (Haynes & Burgess, 2016; Golomb, 2008).

> *"Musical execution may be compared with the delivery of an orator. The orator and the musician have, at the bottom, the same aim in regard to both the preparation and the final execution of their productions, namely to make themselves masters of the hearts of their listeners, to arouse or still their passions, and to transport them now to this sentiment, now to that."* (Quantz, 1752, p.119).
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> *"One should play from the soul, and not like a trained bird."* (C.P.E. Bach, 1753).

Harnoncourt called for modern musicians to rediscover a rhetorical approach in order to avoid being only a technocrat (see Introduction) – to understand and to play music as if it is a language (Harnoncourt, 1992). In the 1970s, music pedagogue Edwin Gordon recognised the importance of understanding and learning music as a language, and coined the term 'audiation' to mean understanding the meaning of a piece of music – even when it is not physically present (i.e. in one's imagination). He points out that in order to audiate, a musician must be able to:

- Sing what they have played.
- Play a variation of the melody.
- Play it in a different key, tonality, or alternative fingerings.
- Demonstrate with body movements the phrases of the melody.

(Edwin Gordon, 2001)

Some people define audiation as (simply) imagining sound that is not physically present (i.e. "inner hearing"), but for the purposes of this study, audiation will be referred to according to Gordon's definition and criteria (above). It can help to understand what audiation is by considering what it is not. Audiation is not imitation. "Audiation is an active response. When we imitate we know what to perform next in familiar music by remembering what we just performed. It is a process of looking backward. When one audiates, however, one knows what to perform next […] by anticipating in familiar music and predicting in unfamiliar music what is to come. It involves forward thinking" (Gordon 2001, p. 4).

Although his pedagogical methods are not part of this inquiry, it is significant to mention what Gordon believed to be the best sequence for learning music: i.e. that it should be similar to the way a child learns to talk – first listening, then "babbling" (i.e. making sounds as if they were words and sentences), then forming real words and sentences. Only then should the child learn to read and then to write. How that sequence translates to music is first aural learning, listening and experimenting with making sounds and phrases before learning to read notation and write/compose music. Many people these days begin their music education by reading notes and learning to understand how music is constructed. Gordon's approach seems a more natural and holistic one, involving implicit mechanisms in the early stages as well as a perception of music as communication.

Practicing according to the audiation criteria – singing, playing variations and using body movements (gestures) – involves external focus. The musician is exploring how to produce the music by experiencing the shape and meaning of each phrase through a multi-modal explorative process.[21]

Audiation is clearly present when a musician is playing well, but the performer may not necessarily be consciously aware of it. The following sections will deal with aspects of audiation in depth. The first – and crucial – element of audiation involves imagining the music that is about to be played (anticipatory auditory imagery). The following section addresses the question, "What is musical imagery and how does it work?"

[21] Terms more familiar to musicians are "ear training" and "inner hearing". Ear training is a normal part of formal music education and involves being able to identify (by hearing) elements of music such as pitches, intervals, chords and rhythms. Inner hearing refers to the ability to hear music inside our heads without the aid of an outside sound source. Audiation involves inner hearing.

Musical Imagery

The key component of audiation – and of external focus for musicians – is the use of clear and vivid musical imagery. Musical imagery is a process of imagining music that is not present in the physical world and can involve not only imagining sounds but also visual, proprioceptive, kinaesthetic and tactile properties related to making music (Keller, 2012). For a trumpeter, an example of modality-specific imagery could be imagining the sound of the next note or phrase, or the written notes, or how the body could feel whilst playing a particular section.

Although musicians seem to primarily use auditory imagery, musical imagery can be a complex multimodal process, involving modalities like vision and movement, but also emotions or more abstract concepts. By imagining a character, mood, narrative or emotion connected to the music, imagery of specific sensory qualities is evoked. These sensory aspects can be initiated by an abstract or 'amodal' concept: for example if a trumpeter wanted to shock the audience with the idea of a fanfare or evoke a heroic scene, which in turn leads to specific performance characteristics. Another example would be playing rhetorically – i.e. as if a phrase has speech-like qualities in order to evoke an emotional response from the listener. By using rich holistic images, the musician is engaging in a complex process of multi-modal imagery involving some or all of the aforementioned modes: hearing, sight, smell, touch and proprioception.

In a recent publication, Rebecca Schaefer makes a distinction between *sensory* imagery – where someone is deliberately imagining a sound, image, etc. – and *constructive* imagery (Schaefer, 2014). Constructive imagery is described as an unconscious process of perceptual organisation that creates an understanding of the sounds as 'music' – i.e. to perceive patterns and be able to predict what may happen next in the music (this description has parallels with the definition of audiation). Constructive imagery processes allow an active listener to 'follow' the music, by relating the incoming information to what they already know, by constructing internal models of the musical structure. Similar pieces to ones that the listener already knows will make 'sense' to the listener even if he hasn't heard them before. Thus imagery is closely interconnected to perception and memory – our past experiences are thought to help us to understand new experiences. Since every person has a unique biography of listening experiences, Schaefer hypothesises that they would experience music differently depending on what they have heard in the past (Schaefer, 2017).

Underlying Mechanisms of Musical Imagery

> *"When we imagine something, the related neural processes are at least partly shared with those of actually perceiving or performing the same stimulus or action."* (Schaefer, 2017, p. 25).

The mechanisms behind musical imagery are not entirely understood but recent research indicates that they are closely connected to other cognitive and motor mechanisms (Schaefer, 2014, 2017; Keller, 2012). Keller outlines three mechanisms that underlie music imagery during playing: *working memory* makes mental representations of specific aspects of the musical patterns; *action simulation* involving sensorimotor brain processes – similar to those used when the actual movement takes place; and the formation of *internal models* – where physical states and events are represented in the brain. Keller explains how these three mechanisms combine: "Thus, anticipatory imagery facilitates the planning and execution of musical actions. This type of imagery is a top-down controlled process to the extent that the performance goal – a representation of the ideal sound – is kept active in working memory." (Keller, 2012, pp. 208-209)

Benefits and Uses of Musical Imagery for Musicians

Anticipatory auditory imagery has a positive effect on selecting the exact movements required for producing the desired sound (including intensity, articulation and intonation), and efficient and effective movements. It also facilitates accurate timing, and even improves (interpersonal) timing and coordination within an ensemble (Keller, 2012).

Musical imagery can be used in a variety of ways by musicians: e.g. for mental rehearsal in preparation for performance, for memorising repertoire, enhancing expression, and to help avoid performance anxiety (Schaefer, 2014; Connolly & Williamon, 2004). Using imagery is a form of mental practice. By imagining playing, the player is activating many of the same neural processes as when actually playing, and for this reason it is a useful form of practice – for example, when there is no opportunity to play with one's instrument or when one has an injury. Imagining music can also be an enhancement to actually playing, in that one is imagining (and therefore practicing) ideal music – a version without errors. In this way good mental training is a form of errorless learning (Masters, 2012; Davidson-Kelly et al., 2015). On one hand mental training requires that the musician already knows the correct movements, but on the other hand by mentally imagining the result of the movements (the ideal sound or effect) it can be used to find and learn them. It seems that deliberately practicing musical imagery helps to strengthen its effects – that musicians can train and improve their ability to imagine (Schaefer, 2017; Keller, 2012; Trusheim, 1991; Connolly et al., 2004), and that elite players are often masters of anticipatory auditory imagery (Trusheim, 1991; Buma et al., 2014).

Although the deliberate use of musical imagery is effortful (Keller, 2012), it can have a light cognitive load (Schaefer, 2017). Schaefer suggests rich, holistic, multimodal forms of imagery can be most effective for learning or rehearsing music. Although there has not been much research on the effects of musical imagery on musicians, there is no doubt that it is helpful not only for use as mental training to learn and memorise repertoire, and to learn and

develop skills and prepare performances, but also during performance itself.

Although mental training and the use of imagery is known to be beneficial to musicians (Clark & Williamon, 2011; Holmes, 2005) it is not yet a usual part of mainstream music pedagogy (Connolly & Williamon, 2004; Davidson-Kelly et al., 2015), and there is not yet much information available for musicians to apply it. It is worth noting two good examples of the (sparse) pedagogical knowledge available for musicians to apply to their practice. In his book *The Mind's Ear*, Adolphe (2013) presents many practical examples (in the form of exercises) of how to use music imagery to train musical skills. The book *Musical Excellence* (Ed. Williamon, 2004) includes imagery exercises to train skills as well as performance preparation (Chapter 12: Mental skills Training, Connolly & Williamon). Considering the clear benefits outlined above, there is a strong argument for integrating mental training and the use of musical imagery in conservatoire curriculums.

Focussing on Ideal Music

Famous tuba player and brass pedagogue Arnold Jacobs often referred to the importance of focussing on "ideal music": "Listen to 'ideal music' while playing; don't listen to yourself. […] When you have controlled the sound, you have controlled the body" (Jacobs in Nelson, 2006, p. 23)[22]

The importance of anticipatory auditory imagery is especially important to brass players because, like singers, if they cannot hear the note (by using auditory imagery) before they play it, they risk producing the wrong one. Natural trumpet and natural horn players are at even more risk as they are playing an instrument without valves, and the speed and form of the air needs to be even more exact.

In an ethnographic study of leading orchestral brass players (including Arnold Jacobs) in 1987, William Trusheim found that the players (members of the top symphony orchestras in the USA) used audiation and mental imagery extensively in practice, rehearsal and in performance. As Trusheim's study and his findings have strong relevance for the current thesis (it was carried out on brass players and involved audiation and auditory imagery) they are worth describing here in detail. Trusheim's article *Audiation and mental imagery: implications for artistic performance* (1991) describes the original study as well as providing background in audiation and mental imagery.

Trusheim found that the brass experts used auditory imagery for practice, in rehearsal and during performance to build consistency, note accuracy, musical understanding, expression and interpretation. They also used mental rehearsal techniques to prepare for performance. He found that imagery skills varied from one individual to another – in vividness, controllability

[22] Several books have been written about Jacobs' teaching, but, sadly, not by Jacobs himself. They include: *Also sprach Arnold Jacobs* (Nelson, 2006) and *Arnold Jacobs: Song and Wind* (Taylor, 1996).

and fluency, and through conscious practice, imagery skills could be improved. He interviewed 26 of the most prominent US orchestral brass players at that time – from five major symphony orchestras (Baltimore Symphony, Boston Symphony, Chicago Symphony, New York Philharmonic and the Philadelphia Orchestra). The aim was to "explore the potential importance of mental images and imaginary strategies in brass performance" (Trusheim, 1991, p. 140). Not only was auditory imagery reported to be used as a strategy, but also examples of kinaesthetic, visual and multisensory imagery, e.g. of programmatic nature, or relating to a mood or atmosphere (Trusheim, 1991). Mental rehearsal was used by many players, and fell into two categories: spontaneous and controlled. Spontaneous mental rehearsal occurs when a player is conscious of an image without having consciously evoked it. Controlled mental rehearsal involves conscious audiation of a passage in order to explore expression or interpretation or to work on a technical problem. Another popular form of imagery found in the study was the recreating of the performance environment using positive guided imagery. During performance many of the players would audiate complete passages directly before playing.

Trusheim concluded that auditory imagery was of great importance to the brass players. They could imagine with a high degree of vividness, clarity and detail, though some developed their imagery skills more consciously than others. He further concluded that a convincing and artistic performance relies on the use of imagery.

It is curious that although so many of the eminent brass players of the late twentieth century consciously practiced auditory imagery, a mainstream brass pedagogy involving the use of imagery and audiation has not evolved (with the notable exception of Arnold Jacobs and his followers). Brass players at that time were – and still are – primarily concerned with teaching technical details, internal focus and exploring "hardware solutions" (types of instruments and mouthpieces).

Singing and Gesture

Edwin Gordon's criteria for audiation included the ability to sing and demonstrate with body movements the phrases of a melody (Gordon, 2001, p. 5). Singing out loud is a way for a musician to internalise melodies, explore and understand musical structure, as well as to improve ear training and sight-reading. Many musicians sing their repertoire during practice. In addition to the benefits mentioned, singing is a way for instrumentalists to learn repertoire without tiring the muscles needed for playing. Teaching music to children often relies heavily on singing. In the pedagogical systems designed by Suzuki, Kodaly and by Dalcroze, singing is an important aspect. By singing we are literally embodying music.

> *"Words have only the tongue as a tool; gestures however can make use of all parts of the body"* (Mattheson, 1739 in Burgess, 2016, p. 243).

Making gestures in order to get to know a piece of music is not something that most musicians do (although it is included in many musical games designed for children). Teachers, however, often use gestures during a lesson to illustrate a phrase or to accompany the student whilst playing. This way of non-verbal communication during a lesson can be very effective. Conductors rely on using gestures to communicate to an orchestra or choir their musical intentions. It is therefore surprising that practicing and exploring a piece of music by using body movements is not part of a mainstream pedagogical toolbox. Movements can not only help the musician to feel a metrical pulse, but also to clarify how fragments of the music are shaped and articulated as well as the emotional content and energy associated with them.

Playing Variations

Extensive empirical research supports the idea that practicing variations of a movement or skill is more effective than practicing only one version or one version at a time. A generalised motor program (in the brain) connected to a movement, and made up of "schema" (a set of rules relating actions to outcomes), is built and strengthened by varied practice (schema theory was described in Chapter 1). Many studies on varied practice have been made in the field of sports – for instance, involving a ball-throwing task where one group of participants practices several distances during a session (varied practice) compared to a group who practice only one distance (constant practice). The results show that although the constant group improved more during the practice session, the varied group performed better in the retention test (e.g. the next day) and in the transfer test (where a distance that was not practiced is introduced). Retention tests indicate that learning has occurred, and a transfer test shows that the player was able to do a new version of the movement – one that has not yet been tried. Research like this gives strength to Schmidt's theories of generalised motor programs and schema (Schmidt & Wrisberg, 2008). In addition to strengthening schema development, it could be that varied practice is effective because it keeps the player alert and engaged. Playing constant repetitions of the same version can easily lead to mindless repetition, which is not conducive to learning. As yet there is very little research on the effects of varied practice on musicians, but like sportspeople, musicians need to be able to execute their skills in an infinite number of versions – combining note placement, volume, intonation, timing, timbre and articulation.

Practicing music by making different variations is something that most musicians do, though usually by varying one aspect at a time, e.g. the tempo, rhythm, articulation or dynamics. A more effective way of making variations could be to play a phrase or fragment of a phrase with completely differing characters or moods. In this way the variations are complex and rich, and by choosing a musical or expressive concept or analogy for a variation (e.g. playing a section as if it is a lullaby or march, expressing mystery or aggression, or in a light and

playful manner), rather than on a single technical aspect, one is engaging in external focus. For example, playing something whilst focussing on creating a mysterious atmosphere, would inform the player (implicitly) which tempo, dynamics, articulations, rubato, etc., to use. Variable practice can therefore be approached in a complex and nuanced way by involving external focus.

Practicing Musical Intention

The aim of using the above concepts during practice – vivid imagination of the desired sound, singing and gesturing each phrase, and playing different variations of a phrase – is not to practice how to produce the music (technique) but rather to practice one's musical intention. The assumption is that when one has a clear and vivid idea of what one wants to say, the complex mechanisms (motor control) needed to produce the music will develop in an effective and efficient (and unconscious) way. The development of the necessary motor skills would be an implicit process as the musician is directing conscious attention to their musical intention using audiation/external focus. Thus it could be said that a virtuosic technique can be a result of practice and focus on musical intention.