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

Williams, S.G.

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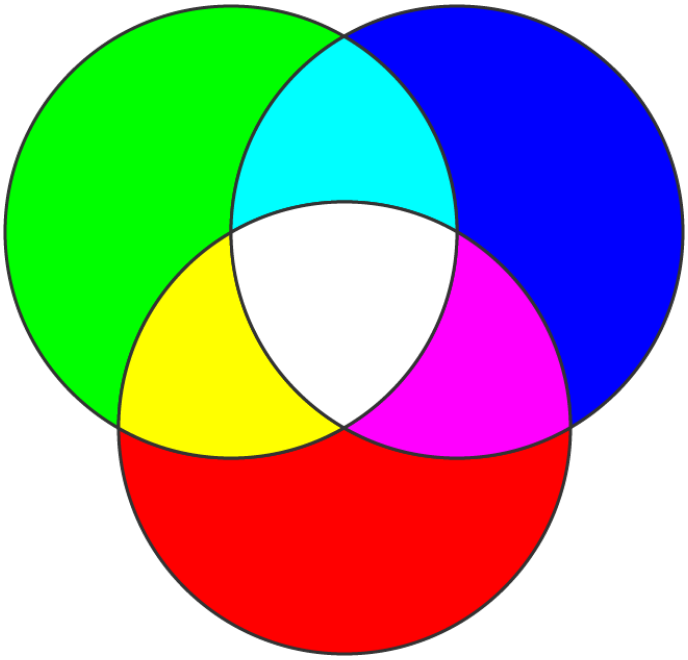
Using External Focus of Attention for Practicing and Performing Music



Susan Williams

Finding Focus

Using external focus of attention for practicing and performing music

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This work is dedicated to all of my students – past, present and future.

GLOSSARY of TERMS

Associative focus: focusing on something that is relevant to the task at hand

Audiation: the comprehension and internal realization of music, or being able to hear or feel sound when it is not physically present

Cognition: the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses

Declarative learning: learning by following verbal instructions

Dissociative focus: focusing on something that is not relevant to the task at hand

Motor skill: a skill involving movement

Movement efficiency: refers to energy expenditure: the less energy expended during execution of a sport skill, the more efficient is the movement

Explicit learning: learning, which generates verbal knowledge of movement performance (e.g. facts and rules)

External focus: focus on the intended result of one's movements

Implicit learning: learning that occurs without the person's awareness

Internal focus: focusing on the movements of the body

Music-making: playing or singing music

Procedural learning: learning by doing

Self-efficacy: one's belief in one's ability to succeed in specific situations or accomplish a task. Self-efficacy is also defined as a person's capacity to bring about a desired result.

"People think focus means saying yes to the thing you've got to focus on. But that's not what it means at all. It means saying no to the hundred other good ideas that there are. […] You have to pick carefully."[1]

"Intention unites desire and action."[2]

[1] Steve Jobs, keynote speech, WWDC Conference, May 1997
[2] Vadim Zeland (2012), *Reality transurfing*

INTRODUCTION

"Why do you play music?" I asked this question to the first year bachelor students at the Royal Conservatoire of The Hague. The answers were about how good it feels to play: "I enjoy the feeling of playing music"; "I like playing together with my colleagues"; "I enjoy communicating with an audience". When I asked: "Why does someone come to a live concert?" I received similar answers: "To feel something"; "To be moved"; "To be touched".

When I asked, however, "What do you focus on/think about when you practice?", the answers were quite different: "Playing the right notes"; "Not making mistakes"; "Intonation"; "Rhythm"; "Sound quality"; "My breathing"; "My hand position"; "What would my teacher think?"; "Am I good enough?"

How can we explain this discrepancy between musicians' goals (to be expressive, connected to the music, the ensemble and the audience, to feel the music and move the listener), and what they focus on during practice (technical and physical control, perfection and approval)? Is it correct to assume that technical proficiency leads directly to or is a pre-requisite for expressive and convincing playing? Do expression and technical facility need to be separate elements of music-making? How do they interact and affect each other? What does a musician need to focus on in order to learn and perform well: technical elements, expressive elements, or both? Does this depend on whether the player is advanced or a beginner, on the difficulty of the piece or skill, or whether the piece or skill is new or not?

The research presented in this dissertation looks for answers to these questions by examining research findings and current knowledge on motor control and attentional focus, and to apply this knowledge to musicians in order to understand better how to focus during practice and performance.

Background and Context: Training Performing Musicians

Training Musicians at Conservatoires

> *"What we need is an* institutional *responsibility and policy to disseminate, discuss and try out practicing alternatives. Why are there hardly any courses on practicing in institutions that depend entirely on this activity? Is it beneficial for the development of institutional quality to act as if all students are expert practitioners?"* (Jørgensen, 2009, p. 91)

A musician's success depends on several things including aspects such as aptitude, environment, instruction, practice approach and amount of practice, self-regulation, and opportunities for performance experience. These are affected by qualities such as motivation,

confidence and self-efficacy[3] and the ability to perform under pressure. In conservatoires today all of these aspects are primarily the responsibility of the main subject instrumental (or vocal) teacher. Every teacher has his/her own approach and knowledge, and each student arrives with his/her own personal history, aptitudes and personality, and thus requires customised attention. For this reason a conservatoire needs to provide tools, techniques and knowledge that can fill any of the gaps in a particular student – teacher constellation. Courses in practicing and performance preparation need to be an integral part of a conservatoire's curriculum (Jørgensen, 2009; Smilde, 2009; Williams, 2014).

By comparison with the typical training of a conservatoire musician, a potential professional athlete would have several hours of supervised training every day from a team of experts including a coach, fitness trainer, mental trainer, and dietician. Athletes are not expected to structure their own training and to train alone. Before the emergence of the conservatoire system, musicians were trained in a master-apprentice system where the young musician would live for several years with the master and absorb many aspects of what it is to be a good musician. Today's conservatoire system is confronted with the challenge of producing elite musicians without the funding to provide hours of supervised practice every day. The usual amount of time with the teacher is one to one and a half hours per week. A logical solution would be to provide classes and information to help students to train themselves so that they can feel confident that what they do in the practice room is quality practice. Practical applications for practicing music based on relevant theories and research from psychology, pedagogy and neuroscience could be made available to both teachers and students in conservatoires.

Courses in teaching musicians how to practice are not yet part of the normal curriculum for most conservatoires (my own courses are an exception) but the subject is gaining interest amongst teachers and institutions, and there have been several international conferences on the topic of teaching practicing in conservatoires in the last few years. After 10 years of teaching courses in practicing and performance preparation both in The Hague and in Bremen I have observed the following:

- Students generally arrive with very idealistic aims, aspirations and expectations. When asked about their aims, they rarely mention making money, acquiring fame or seeking approval or security.
- There are often motivation problems (this is often a result of the initial joy of playing being lost and expectations of musical fulfilment not being met as a student is confronted with the expectations of the institution, the teacher, comparing themselves

[3] Self-efficacy is a person's belief in their ability to succeed in a specific situation or task and is known to have an impact on motivation, learning and performance (Bandura, 1997). Self-efficacy is also defined as a person's capacity to bring about a desired result.

with other students, and thinking that "now it's serious – it is not supposed to be fun anymore").

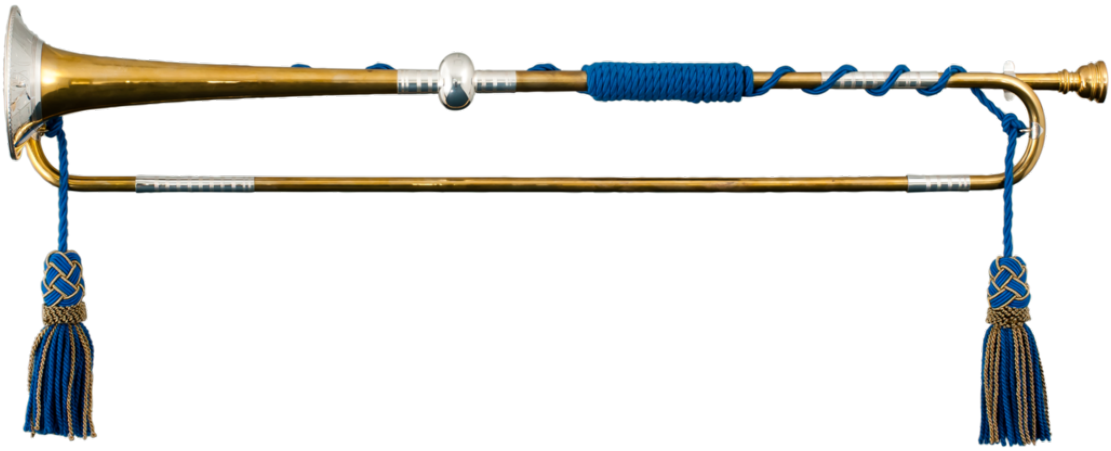
- Many students suffer from injury problems connected with playing.
- There is limited knowledge of how to practice – most students use two or three standard methods (e.g. repetition, playing slowly, changing rhythm).
- Most students rely solely on the main subject teacher for guidance in how to play and perform. In many cases there is little autonomy and ability to reflect and self-regulate.
- Most students struggle with nervousness during performance, which impairs their ability to play to their current capacity.
- Most students trust in a technical approach to playing and practice – i.e. by trying to correct wrong notes through repetition, practicing intonation, tempo, rhythm and articulation and/or consciously steering and analysing their physical posture and movements. Thus practice is often primarily problem solving rather than exploration, and focussed on avoiding errors.

Mastering the Natural Trumpet

A lifetime of performing on and teaching the natural trumpet has taught me that there is no real security and ultimate control that will ensure that a concert, phrase or single note will be successful. All musicians live with this fact. It may even be this very human vulnerability that engages an audience and makes them come to a live performance rather than listen to a 'perfect' recording. Nevertheless, our job is to be able to play as convincingly as possible. A great musical result will include a high level of technical accuracy as well as being expressive. Technical accuracy can be to some extent measured – the amount of right and wrong notes, intonation, tempo, rhythm and whether the composer's markings or the conductor's commands are followed. Musicality, expression and the ability to move the listener are more subjective. Different audience members can be affected in vastly different ways. The fact that technical accuracy can be quantified (measured) and that expressivity and musicality are more subjective concepts could be the reason that many players focus on technical aspects during practice – it's easier to judge the result.

A natural trumpet player is confronted with the danger of ruining a concert with a resounding 'split' or wrong note. Errors on a natural trumpet are clearly audible. The instrument consists of a long bended tube with a mouthpiece on one end and a bell at the other. There are no valves or mechanisms that help to produce the right note. Each note requires an exact form and speed of air, making accuracy, fast passages, large intervals and high register challenging for the performer.

Figure 0.1 A Natural Trumpet



Many players (including myself) have noticed that the more they focus on hitting the right note or on avoiding mistakes, the worse they play. Looking for more security as a performer and teacher of the natural trumpet has led me to this research topic. Knowing what could benefit trumpeters on the subject of what to focus on during playing is very likely to be relevant to musicians in general.

A Historical Perspective to Musicians' Training

A technical focus was not always the norm for musicians, and for this reason it is important to see how this occurred by looking at it from a historical perspective. The nature of musicians' training changed radically after the emergence of French conservatoire system (a system that developed into the one we have today).

Thanks to the organisation of shared knowledge – something that developed enormously in the 19th century – what used to take a lifetime to learn could be learned in a few years (Ericsson, 1996). Since the advent of the French conservatoire system at the end of the 18th century, the teaching and learning of music has become more systematic and specialised. This allowed knowledge and skills to be passed on in a much more efficient way than in previous centuries, and resulted in a general development of expertise. Knowledge was collected and disseminated freely. In the field of music, method books were written and the study of music was systematised and opened up to the general public. The former (pre-19th century) master-apprentice system was controlled by guilds; knowledge was largely conveyed through an oral tradition and was usually kept exclusive to the guild members.

In some respects the new system threw out the baby with the bathwater. In a recent study, Rineke Smilde found that professional musicians complained that what they lacked in their

conservatoire training was "life skills" and experience; that the focus was too much on honing specific technical skills (Smilde, 2009). Life skills and practical experience were the very thing that an apprentice experienced in the middle ages, renaissance and baroque times. In earlier times the master-apprentice relationship was based on observation and imitation, and was a full-time one. As mentioned previously, the apprentice lived with the master for several years and learned how the master approached his profession, and not only musical skills. Often the apprentice or journeyman played together with a master in performances to gain experience. In the modern system, this relationship – although still regarded and experienced as the most important one by students – is limited to one hour or 90 minutes of instruction per week.

The approach to music itself and the role of the musician also changed. In baroque times the task of the musician was to move the listener[4] (Quantz, 1752; CPE Bach, 1753; Mattheson, 1739; Haynes & Burgess, 2016). Trained musicians were aware that music portrays emotions, and the devices of affect and rhetoric and were learned. Being able to compose and to improvise was also an integral part of being a good musician. In the 19th century the emphasis began to shift to a more technical approach, both to the understanding of music as well as how to play it. During the 20th century, in conservatoires the study of music became more and more subdivided into parts: theory, history, skills. Skills themselves were dissected into controlling movements, breathing mechanisms, muscles, ear training, etc. A musician was a specialised *instrumentalist*, by comparison with, for example, a Stadtpfeifer[5] in 18th century Germany, who was trained as a *musician* and was expected to be able to play four or five instruments competently. Most importantly, the primary goal of musicians changed from serving and moving the listener to being, themselves, in the spotlight. The idea of training specialist 'virtuosi' was firmly established in the 19th century and continues today.

What conservatoires are facing today is the necessity of producing musicians that are multi-talented (e.g. they can play repertoire from several genres, or even on more than one instrument), flexible and have entrepreneurial skills (Smilde, 2009). The cultural landscape has changed and is continuing to change at an increasingly rapid rate. One aspect of concern for musicians and their teachers is the increasing demand for technical perfection on stage. Musicians are often overly concerned with error avoidance and don't have adequate training in error and risk management (Kruse-Weber & Parncutt, 2014; Kruse-Weber & Marin, 2016).

The result of today's intensive technical approach and ever-increasing demand for (technical) perfection is an increasing prevalence of injury, burnout and depression amongst professional musicians (Ackermann, Driscoll & Kenny, 2012). An additional by-product of technical focus

[4] The role of emotion and music composition and performance will be mentioned several times, but the field of emotions and music is too large to address in detail in this study.
[5] Translation: town musician.

is that musicians (and also audiences) are losing "literacy" – a concern voiced by Nikolaus Harnoncourt (already) in the 1980s:

> *"New methods, or methods similar to those used over two hundred years ago – must be used to train musicians. Rather than teaching music as a language, our academies drill only techniques of performance. This focus is, however, merely the lifeless skeleton of technocracy."* (Harnoncourt, 1982 p. 13).[6]

Even though there has been an increase of information, knowledge and insights relevant to musicians' learning and performance in the last decades – particularly in the field of music pedagogy and psychology – the application of new knowledge is slow. Teachers at the conservatoire level are themselves usually not trained in pedagogy. Most teachers tend to use a traditional 'transfer' approach to teaching, involving giving verbal instruction, or by modelling (playing for the student). Others favour an approach based on the belief that musicians must first learn and develop technical skills before focussing on expression (Carey, 2013). Whilst the latter assumption seems logical, there is an increasing amount of evidence from the field of motor skill development – particularly in attentional focus – to suggest that a technical approach to learning complex skills like playing music is not the best way to learn efficient and effective music-making.

Approaches to Learning to Play Music

Focussing on Understanding and Controlling Technique: a Declarative Process

A convincing performance requires technical facility. But does focussing directly on technique bring the best results? In the 20th and 21st century, musicians have been approaching music-making in an increasingly technical way involving declarative learning[7], and consciously controlling the body's movements (i.e. using internal focus).

For example, when playing the phrase in Fig. 0.2, a trumpeter may give himself the following instructions: "Take a good deep breath. Expand the ribs and engage the "support" muscles, below your stomach. Tighten the corners of the mouth. Lift the tongue level after the first note for the high C. Keep the air flowing, remembering to lift the tongue level for the high notes. Articulate: ta ti ta-da ta-da ta-da ta ta tee (last one with accent). Play mezzo forte and keep the quavers short…".

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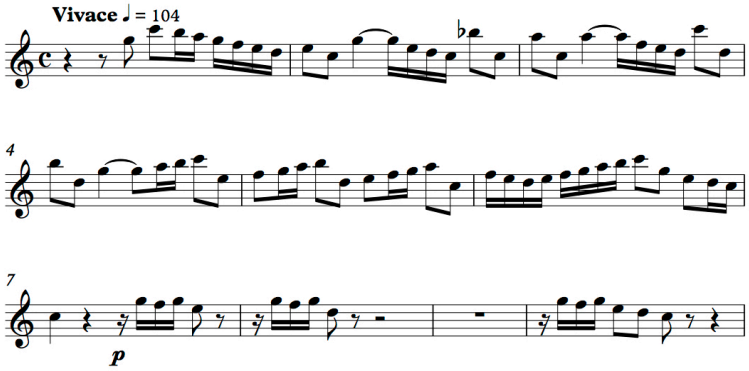
[6] Harnoncourt was not the first to complain about the conservatoire system's inadequacies. For example, in his essay *Unsere Konservatorien* (1895), Hugo Riemann stated "Die heute fast allgemeine *ausschließliche Dressur auf praktische Musikausübung* ist eine traurige Errungenschaft der neuesten Zeit, und sie ist lediglich auf die Einrichtung der Konservatorien zurückzuführen" (Riemann, 1895, p. 25; emphasis from the original). [English translation: The drilling of musicians exclusively towards performing the music technically is a sad accomplishment of our current times, and the establishment of the Conservatoires is entirely responsible for this.]

[7] Acquiring skills or information that one can speak about.

Figure 0.2 A Fragment of Trumpet Repertoire[8]



The above example combines instructions to the body and technical instructions about the musical score. The result is that players use their conscious minds in an analytical way to steer the learning and playing process. The basic assumption in this approach is that music-making should be steered in a declarative way – using conscious cognitive processes. As depicted in Figure 0.3 – when the technical details work and are co-ordinated, one can add expression.

Figure 0.3 A Model of a Declarative Process of Learning to Play Music

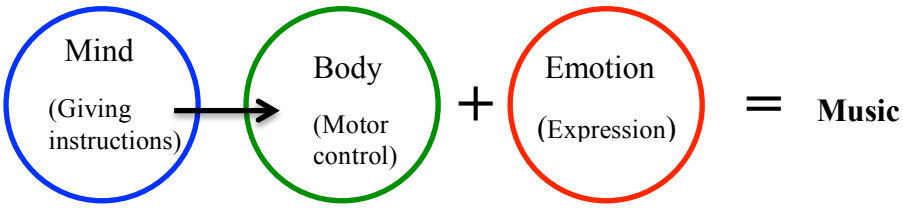


Figure 0.3. A model illustrating how instructions (from the mind) attempt to steer the body's movements in order to produce a precise technical result. After this is achieved, the player can add expression.

One reason for the predominance of the above approach could be that we trust more in an analytical and technical approach due to advances in our knowledge of the functions and anatomy of the human body and brain, as well as in technology. An advantage of a technical approach is that it is quantitative (i.e. measurable). We can measure the result – we can tell how it is going (e.g. by checking things like accuracy, volume, articulation, speed, pitch or timing). Measuring whether a performance was expressive, moving and artistic is a much more subjective and difficult matter. It could be for this reason that much of a musician's focus is on technical perfection and control.

Another reason for focussing on technical perfection is that we live in an age where 'error avoidance' is prominent. The recording industry and rising competition in the music industry

[8] From BWV 43 (J.S. Bach) No. 7. Aria

create pressure on performers to be accurate and 'perfect'. Analysis and judgement during practice and in lessons are important aspects of the process of striving for perfection.

Is focus on the techniques of playing and performing the most efficient and effective way to learn and perform accurately and expressively, or is it better to focus on expression? Whilst technical accuracy is a very important attribute for a professional musician, is focussing on technical accuracy the best way of achieving it?

Focussing on Expression: a Procedural Process

By focussing on their intended result (expression) rather than on steering technical aspects, a musician is enabling a procedural process rather than a declarative one. Procedural learning is a process of acquiring a skill through repeated performance and practice: "Virtuosity is acquired by 'doing', that is, by practicing […], and not by being told what to do." (Wulf & Mornell, 2008, p. 14).

Focussing on expression rather than on technique would be to focus on *what* rather than on *how*: what a phrase should sound like or feel like for the listener – the musical intention. By focussing on the desired result, the mind of the player is not interfering with the complex and implicit (unconscious) process of motor learning. "If we trust our motor system to do its job, it is more likely to do that job than if we interfere with it by trying to exert control over it." (Wulf, 2007).

Taking the same musical example from Figure 0.2, the player would be imagining how the phrase should sound or what effect he is trying to make. His movements and choices of volume, speed, articulation would be informed by a non-verbal process originating from his imagination of the desired result. In this case, emotion (in the form of musical expression) is informing the mind (which is engaging in focus rather than judgements and analysis) resulting in the body's movements (motor control).

Figure 0.4 A Model of Procedural Learning for Music-Making

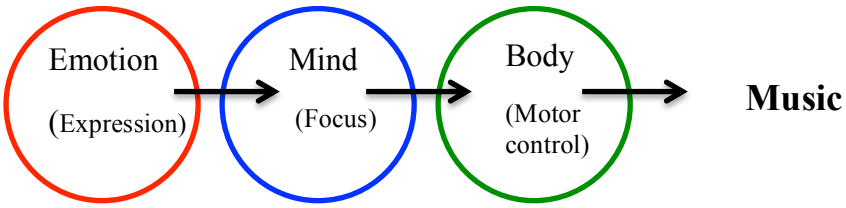


Figure 0.4. A model showing how emotion (in the form of musical expression) is informing the mind (in the form of focus) which in turn informs the body's movements (motor control).

The key to the above process lies with attentional focus. When focussing only on technique the musician uses the conscious mind to analyse and give declarative instructions. Focussing on expression requires that the musician uses his mind to imagine the desired outcome: "Listen to 'ideal music' while playing; don't listen to yourself […] fill your mind with sound.

Use nuances. When you have controlled the sound, you will have controlled the body." (Arnold Jacobs, in Nelson, 2006, p. 21).

The question often asked by musicians and addressed by this research is "What should I focus on during practice and during performance?" Focussing on the desired outcome – whether it be the desired sound, shape of phrase or expressing emotion, musical effect or meaning – is a form of *external focus* – a term recently coined in the movement sciences. Jacobs' views (above) are not only relevant for experienced players. Even a beginner can benefit from focussing on a rich representation of the sound or an effect they want to make whilst learning a new piece or skill.

Aim and Relevance of this Research

The last two decades have seen a wealth of research from the fields of psychology and human movement science about attentional focus, which provide vital clues to answering the question "What should I focus on during practice and during performance?" Of potential significance are findings that suggest that the learning of complex movements (of the type needed in sports and playing music) is better achieved implicitly, without much conscious attention, and that an external focus of attention – focussing on the intended result of the body's movements – is more effective than an internal focus of attention – focussing on how to move the body.

The aim of this research is to determine if, how and why external focus can be of benefit to musicians. So far, general research on external focus – although extensive – has been mostly in the fields of sports and rehabilitation and by using quantitative methods to test relatively simple movements in controlled laboratory environments. Interpreting and applying external focus research for musicians in a naturalistic setting could result in valuable information about how to practice as well as how to focus attention during performance.

Research Questions and Hypothesis

The main research questions for the current work can be formulated as follows: ***How can we characterise external focus for musicians and what are the effects of external focus on musicians' learning and performance?*** An additional question is ***Do the kind of practicing and performance preparation methods and approaches used in this study have an effect on the participants' subsequent practice behaviour?***

The first research question asks about the nature of external focus in a musician's context. For sportspeople, an example of external focus (i.e. focus on the intended result of one's movements) would be to imagine the movement of an implement (e.g. golf club or racquet), or the intended trajectory of a ball. This could also extend to using an analogy (e.g. swimmers imagining their feet as fins), rather than focussing on the actual movement of their arm, the positioning of their body, or the pressure they are exerting (internal focus) (Wulf, 2007).

How does the concept of external focus translate to music-making? This second part of the (first) research question inquires about the effects of external focus on a musician's skill acquisition and on performance. Based on empirical findings on external focus of attention, the expectation is that both learning and performance would be enhanced by external focus.

The second question inquires about whether the approaches and tools based on external focus that are presented to the participants in Projects 1-3 have an impact on their practice behaviour afterwards. Changing habits and beliefs is very difficult – especially in a field that is based on tradition. It is be important to see if the musician's own behaviour is impacted by the study.

The hypothesis of this study is that external focus is beneficial to musicians' learning and performance. Sub-research questions and hypotheses are listed at the beginning of each of the empirical projects that comprise Part II of the study.

Research Approach

Applying the concept of external focus to the field of music in a naturalistic way requires a richer and more pragmatic approach than has been taken by the research so far undertaken in the movement and sport sciences. The combination of my own arts practice, music pedagogy experience and empirical research results in a unique contribution that addresses the wider realm of artistic practice. Making music is such a multifaceted phenomenon that convergent evidence from multiple disciplines and methods is required in order to obtain useful insights.

The research presented in the current thesis was compiled by designing and carrying out a series of three empirical projects in both semi-controlled as well as natural environments. A mixed methods research approach was used, with quantitative and qualitative elements. A music-pedagogical practice tool based on external focus was designed and used in all three projects.

The aim of the study on external focus had several aspects: to translate the idea of external focus from movement science into the field of music (how can external focus be characterised for music-making?); to design several ways to use, test and explore the application of external focus in field situations; and to collect data and find information to elucidate the effects of external focus and the instances in which it can work for musicians.

Although my own experiences and observations lead to the assumption that external focus is beneficial to musicians, the intention of the study was to see if there is scientific basis for this assumption, and to test it in musical practice.

Outline of this Dissertation

This dissertation is divided into three parts.

Part I – Making Music (Chapters 1-3) – presents a literature review of relevant theories and research on motor learning and attentional focus. Conclusions from the review point out that music-making involves complex motor control and that results from research into implicit motor learning and external focus of attention suggest that external focus could be of benefit to musicians. Audiation is defined and proposed as an example of external focus for music-making, and a practice tool based on audiation is designed and then used in three empirical projects/interventions.

Part II – Focussing on Musical Intention (Chapters 4-7) – presents the three empirical projects in which the audiation practice tool is evaluated experimentally.

Part III – Discussion, Conclusions and Recommendations (Chapters 8-10) – here the combined results of the projects are then compared with the existing research on external focus to determine whether external focus is beneficial for learning and performing music, and whether there are some new insights into external focus of attention from a study based on musicians.

A brief description of each chapter follows.

PART I: Making Music

Chapter 1 – Learning Motor Skills – explains that music-making is a psychomotor activity involving motor learning. The nature and aspects of motor learning are explained, and the main current theories of motor learning are presented and discussed. Of particular interest and importance is the implicit motor learning theory – a theory put forward by Richard Masters, which claims that movement skills are better learned without much declarative knowledge or conscious cognition. The three stages of learning are described, and the role of attention in motor learning is discussed –in particular the question of what kind of attention is recommended for each stage of learning. Conclusions from Chapter 1 raise doubts about the efficacy of declarative learning – even in the early stage of skill acquisition.

Chapter 2 – Attentional Focus for Learning and Performance – discusses attentional focus and presents in detail the relevant research and findings on external focus. The chapter concludes with a report on research about external focus in the performing arts and presents ideas about how external focus can be applied to music-making.

In Chapter 3 – Audiation: Practicing Musical Intention – audiation is proposed as a form of external focus for music-making. Audiation is defined and described as the use of musical imagery, singing, use of gesture and practicing variations as a way to practice exploring and

clarifying the musical intention of the player. The chapter forms a basis for the design of a practice tool – APT (Audiation Practice Tool) – to be used in the three empirical projects.

PART II: Focussing on Musical Intention: Three Empirical Projects

Chapter 4 – An Overview of the Projects – presents three empirical projects that explore the effects of external focus on musical learning and performance. A brief description of each project is followed by the research questions and hypotheses as well as an explanation of how external focus is used in each project.

Chapters 5, 6 and 7 – describe each of the three projects respectively. Aims, subjects, methods and measures, procedure, results, analysis and conclusions are presented for each of the projects. Project One asked "What are the effects of external focus on the accuracy and confidence of natural trumpeters?" using a mixed methods intervention. The results showing the benefits of the external focus tool compared to the participants' usual way of practicing were around the threshold of significance for accuracy, and there were positive trends for self-efficacy for performance and for confidence. Project Two investigated how external focus affected the preparation and performance of a trumpet consort concert (the seven participants from Project One also participated in Project Two). Qualitative data was collected in this project, revealing that the participants were more engaged and suffered less nervousness than usual during performance. Project Three involved a mixed ensemble of string players, trumpeters and keyboard players in a workshop and performance of instrumental music. Again, external focus was at the centre of the pedagogy and methods used in the project, and the participants were asked for their feedback. The results revealed that several of the participants experienced a positive "out of the ordinary" concert experience, as well as positive reactions to approaching rehearsals and concert preparation with external focus.

PART III: Discussion, Conclusions and Recommendations

Chapter 8 – General Discussion of the Research Findings – connects the theory and research presented in the literature review with the findings from the present study (including all three empirical projects), revealing what this study can confirm and suggesting further areas for research.

Chapter 9 – Conclusions: Approaching Practice and Performance – argues a holistic approach to music-making. The three stages of learning that were described in the literature review in Chapter 1 are reformulated to reflect how implicit learning and external focus can be used to benefit the learning and performing process.

Chapter 10 – Disseminating and Applying Research on Musicians' Motor Learning to Musicians and their Teachers – reflects the motivation behind the research presented in this

thesis as well as illustrating a way of presenting information about psychomotor learning in such a way that it can be readily used in the practice room, in the lesson and on stage. A workbook for musicians – *Quality Practice* – written by the researcher is presented as an example of applying research and findings from psychology, pedagogy and neuroscience about motor learning to music-making.[9] A central theme of this workbook is the role of attention throughout the learning process. Making relevant empirically based knowledge available and accessible for musicians can thus encourage new and innovative ways to practice, learn and perform.

[9] See Appendix X

PART I: MAKING MUSIC

Making music is a sensorimotor activity: the result of a combination of motor skills (involving complex movements of the body) and sensory skills (involving the collection of aural/listening, visual and tactile experiences). Learning to make music requires hours and years of practice involving the repetition of highly complex movements until they can be reproduced reliably (Altenmüller, 2012). Experts in music pedagogy advise that effective practice needs to include developing focussed attention, using goal setting, self-regulation, self-reflection, and the ability to form good strategies (Chaffin & Lemieux, 2004; Ericsson, 2002; Araújo, 2016; Zimmerman, 1998; McPherson & McCormick, 2006; Bonneville-Roussy & Bouffard, 2015).

Although many pedagogues and trainers stress the need for developing attention, focus and working with goals, there is often little advice on what to focus or concentrate on. Musicians are usually advised to repeat something until it is automatic and to notice if something is right or wrong – i.e. to evaluate their playing or compare what they are doing with what they want to achieve. What often occurs is that the musician goes into a process of trying to understand intellectually not only what and why something is or is not optimal, but also how to control the process consciously. Recent theories on motor learning suggest that understanding and controlling complex movements consciously impairs optimal learning and performance. Implicit (unconscious) motor learning and external focus of attention (focussing on the intended effect of one's movements) will be presented in this chapter as an alternative to conscious control and understanding.

In the first chapter the current mainstream views and theories of motor control and performance are outlined, and the role of attentional focus is discussed. The second chapter argues why using external focus could be the most effective and efficient way to learn and perform music. In Chapter 3, ways of focussing "externally" for musicians will be proposed, forming a basis of the design of the empirical projects in this study.

1

Learning Motor Skills

As playing music requires motor skills it is useful to understand the principles and theories of motor control and motor learning in order to know how to train a musician well. It is not within the scope of this dissertation to undertake a detailed review and critique of all motor control and motor learning theories, though aspects that have relevance for an inquiry into external focus will be discussed in detail. A brief summary of the relevant theories to this research is presented below, beginning with defining what type of motor skill playing music is.

What Kind of Skill is Music-making?

Playing an instrument involves different types of motor skills. Schmidt and Wrisberg (2008) describe categories of skills within sports that can be directly applied to music-making. The skill categories can be visualised as a tree-diagram (Figure 1.1). The top of the diagram shows that skill can be subdivided in motor and cognitive skill (each containing procedural and declarative knowledge). Cognitive in this context refers to conscious cognition[10] - skills requiring conscious thinking and decision making, whereas motor skill refers to a task involving movement and little or no decision-making.[11]

Motor skills can be divided first of all as open or closed skills. Open skills are those for which the environment is constantly or perhaps unpredictably changing (e.g. during a football match). Closed skills are skills for which the environment is predictable and stable (e.g. shooting an arrow at a predetermined unmoving target) (Schmidt & Lee, 2005). Music-making is generally a closed skill as the environment is relatively predictable and a piece of music is usually rehearsed and prepared in advance with the understanding of how it needs to sound for the concert (and the way the instrument responds can be, in general, considered stable). The last set of categories describes how movements can either be discrete, serial or continuous. Music performance would be categorised a "serial" skill, because it involves the connecting of many discrete movements (a discrete movement – with a discernible beginning and end – would be a single note or a fragment of music consisting of a short group of notes). As a piece of music contains many notes/fragments connected together, it would be categorised as a serial motor skill (Schmidt & Wrisberg, 2008).[12]

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[10] Cognition also involves unconscious processes, for instance the processing of perception, memory, learning, thought, and language without being aware of it.
[11] Cognition is a highly complex subject. An elaborate discussion of cognitive skills is outside the scope of this discussion.
[12] An exception to this definition would be improvisation – which could be considered a continuous movement – or even an open skill. Playing jazz would require a combination of open and serial skills.

Figure 1.1 Categories of Skill

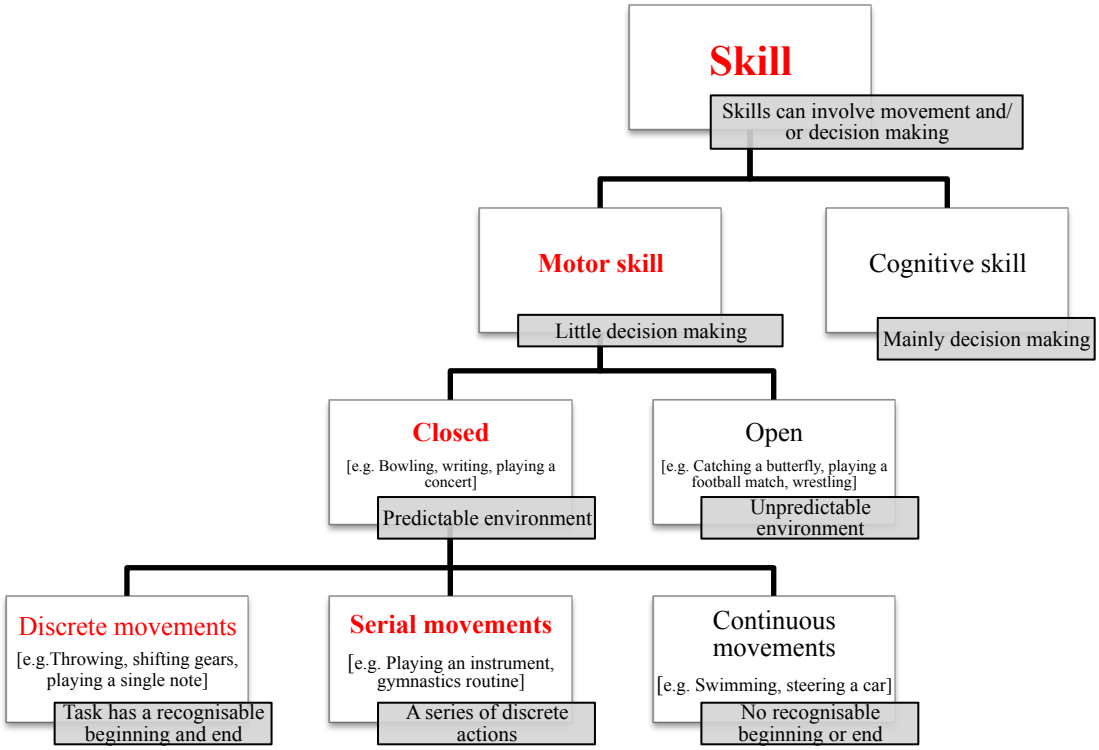

Figure 1.1 illustrates categories of skill, highlighting the types of skills and movements used for playing music (formulated from information from Schmidt & Wrisberg, 2008, pp. 3-8). The red, bold categories describe the skills needed for music-making. Discrete movements are connected to make serial movements.[13]

Now that the type of motor skills for performing music have for the most part been defined as *closed skills, involving discrete and serial movements*, the following section investigates the question "How do musicians learn and perform these skills?"

Current Theories on Motor Control and Motor Learning

What are the current theories that can explain how we learn complex movements and how can these theories help musicians know how to approach the way they practice and perform? The following section describes the two main streams of thinking on motor learning: Motor Program Theory and Dynamic Pattern Theory (Schmidt & Wrisberg, 2008).

Motor Program Theory

Motor Program Theory is probably the most accepted explanation at present for how we learn complex movements. The main concepts within the theory are outlined here and include an explanation of a "closed loop" system and an "open loop" system, and finally "Schema Theory".

[13] Motor Skills do involve cognition – in the form of attention (rather than thinking about strategies and making decisions).

In 1971, Jack Adams introduced the idea that learning a movement involves a "closed loop" process. The process involves four components: 1. Executive – making executive decisions about how to perform the movement; 2. Effector – carrying out the actions; 3. Feedback – getting feedback that provides information; and 4. Comparator – detecting error and comparing the feedback to what was desired (Schmidt & Wrisberg, 2008).

Music example: If we were to apply the closed loop system to describe a musician's learning process it would look as follows:

1. Executive: The player would decide how to play a phrase or fragment of music – this may involve things like what it needs to sound and/or feel like, how to control the body, and what to focus on.
2. Effector: Play the section of music.
3. Feedback: Notice how it sounded, what it felt like.
4. Comparator: Compare the played version with the desired version and detect the errors (leading back to 1. deciding how to play it again).

A closed loop way of processing an action demands a great deal of attention and takes some time to process information during the learning process (Adams, 1971; Schmidt & Lee, 2005; Schmidt & Wrisberg, 2008). This can be useful when learning a new skill, learning certain types of movements (e.g. continuous movements such as swimming, or holding a certain posture), or during early stages of learning (e.g. learning a new piece of music). According to this theory, errors are to be avoided as they are retained in the memory.

Complex short discrete movements (like those involved in performing music) are, however, too demanding on the attention to use a closed loop model (Schmidt, 1975). The open loop system was proposed by Schmidt to explain how one learns and performs skills that require fast reactions. Schmidt introduced the idea that whilst feedback can be available when one is performing an action (as in the closed loop model): "Most types of motor behaviour represent a complex blend of both open- and closed- loop control operations" (Schmidt & Wrisberg, 2008, p. 110). When a complex movement requires fast reaction time, there is no time for processing feedback, and is therefore referred to as an "open loop".

Movements are learned by the development of a motor program. Schmidt explains that the motor program relies on building up a *schema* or set of rules that allow the person to perform new variations of the movement – implying that one does not need to have a new motor program for every skill. Building up the schema involves practicing the movement in various ways. The schema theory presumes that errors are part of the process of collecting information about how to perform.

Music example: Learning to play tones on the natural trumpet could involve playing a few of the easier tones separately and then varying the dynamics, note duration, order of the tones

and articulation. The collected information forms the schema that can then allow the player to be able to play other tones and patterns than the ones practiced.

Dynamic Pattern Theory

> *"Practicing (music) can be considered as a self-organizing process, which frequently starts with uneconomical activation of large neuronal pools in the sensory-motor brain regions."* (Altenmüller & Schneider, 2008, p. 341)

A newer theory – the Dynamic Pattern Theory (Kelso & Schöner, 1988; Newel, 1991; 2003) – states that there are no "rules" generated by movements but rather that they occur and are learned by a system involving "self-organisation" and continual adaptation to the environment through sensory feedback. This theory is very compelling, as it takes into account the complexity of the interaction between the person and their environment. The view that Dynamic Pattern Theory is now the dominant view of the underlying mechanisms of motor learning is also reflected in a recent overview of this research area (Hommel, Brown & Nattkemper, 2016).

Music example: To allow a holistic self-regulating process to occur, a musician could explore a segment of music using variation, improvisation and involving sensory awareness – e.g. focussing on touch and sound, and by focussing on the desired outcome without analysing, comparing or consciously correcting the movements.[14]

Degrees of freedom

There are many possible combinations of muscle and joint activity that can produce a specific action, and there are variations to every movement (e.g. trajectory and form). This is referred to as the "degrees of freedom-problem" (Schmidt & Wrisberg, 2008), as it is very hard to predict specific movement parameters or decide on the optimal movement. Learning how to deal with the many degrees of freedom is a central problem in motor control, and involves the balancing of allowing certain muscles and joints to move during an action, and preventing or "freezing" others (Schmidt & Wrisberg, 2008). In the case of a piano player, for example, this would involve the player freeing (or freezing) the freedom in the wrist, hand and fingers. One of the major roles of motor programs would be, therefore, to "coordinate the many degrees of freedom needed to produce an effective & efficient action". The question remains – to what extent is it important to understand and consciously steer the movements, or is it better to focus on something else and allow a self-organisation to take place? For both sports and

[14] An example of this kind of approach to practicing music can be found in 'Practicing in Flow' by Andreas Burzik (Burzik: Flowskills, http://www.flowskills.com) and also the 'Flow Music Method' created by Eve Newsome (http://www.flowmusicmethod.com.au)

music-making it is the outcome that matters and not how you get there. The dynamic pattern theory suggests that the optimal balancing of the degrees of freedom are found during an unconscious "self-organising" process. Practicing can therefore be considered as a self-organising process.

To sum up: a motor program consists of pre-structured sets of motor commands that are constructed at the highest cortical levels and then conveyed to the lowest centres in the hierarchy responsible for executing the movement. Unlike the motor program theory, in the Dynamic Patterns Theory, there are no hierarchies in contrast to a command-based centre. It seems likely that different theories or combinations of theories discussed above may best explain different types of movement – depending on the type of task, the environment and the skill level of the player (Schmidt & Wrisberg, 2008). Another factor that could be relevant is whether the skill is new – in an early stage of learning – or in an advanced stage of learning. The next section will look in detail at the different stages of learning motor skills.

Stages of Learning Motor Skills and the Role of Attention

It is widely accepted amongst experts in motor learning that learning occurs in stages – each of which has certain characteristics. A description of each stage of learning, its characteristics and the role of attentional focus in each stage is described in the following section. One of the most referred to paradigms was put forward by Fitts and Posner (1973) and describes three consecutive stages of learning that they call **cognitive, associative and autonomous** stages. Although there is general consensus about the stages of learning amongst experts, there is some contention about the role of attention during each stage. A description of each stage follows.

Early stage (cognitive stage)

In the early stage of learning, a skill involving complex movements is characterised by being halting, slow and rigid, and containing inconsistencies and errors. The player is exploring different ways to achieve the goal; getting an idea of the movement, using a step-by-step approach (Gentile, 1972; Schmidt & Wrisberg, 2008; Schmidt & Lee, 2005; Wulf, 2007) or by understanding the patterns involved (Newell, 1985).

Progress in the early stage tends to occur rapidly. For musicians the early stage could refer to first learning to play an instrument, or learning a new skill or piece of repertoire, and would be characterised by frequent wrong notes, halting speed and rhythm and lack of details such as dynamics and articulation. This stage is also called "verbal stage" (Adams, 1971) or "declarative stage" (Hattie & Yates, 2014), as it is generally believed that verbal conscious cognitive processes should be involved during the early stage. Proponents of implicit motor learning, however, believe that declarative processes are not necessary – or even degrade the

learning process (Masters, 2012; Wulf, 2007). This will be discussed in more depth in the following section on explicit and implicit motor learning.

Middle stage (associative stage)

During this part of the learning process, the movements become more efficient, fluent, confident, decisive and adaptable, as well as reliable (Schmidt & Wrisberg, 2008; Wulf, 2007). Progress is usually slower than in the first stage of learning as the player is making subtle adjustments to the movements. A musician's playing would begin to sound more fluid, feel more relaxed, and there would be fewer incorrect notes and more details in the execution. The middle stage is also referred to as the "motor stage" (Adams, 1971).

Later stage (autonomous stage)

In the later stage of learning, the person's movements become more automatic and exhibit more consistency, efficiency and confidence. Execution is smooth, effortless and automatic as well as accurate and adaptable. At this stage, reliable performance is possible (Schmidt & Wrisberg, 2008; Wulf, 2007). In the case of musicians, the music would feel more effortless, sound fluent, have nuances and be (virtually) free of wrong notes.

Overlearning

It is worth mentioning here that sometimes a skill can be "overlearned" and starts to degrade as a result of too much practice (Altenmüller, 2006). A performance would revert back to a more halting rendition, be less fluid and have more errors. Reliable performance is possible only when the autonomous stage has been reached. Although automaticity is the goal of practice, it also has its downside. Learning requires not only repetition, but also deliberate practice involving concentration and attention to structured goal setting in order for control to become more automatic (Ericsson, 2008). Paradoxically, once automaticity is achieved and the player is able to shift attention elsewhere, improvement can stop and development of bad habits or even degradation can occur (Altenmüller, 2006, 2012; Hattie & Yates, 2014).

The Role of Attention During the Stages of Learning

Of importance to this thesis is the question of where a player's attention should be during a particular stage of learning. During learning, cognitive demands gradually decrease as the task becomes more automatic. The person's attention is at first often on controlling the movements by breaking them up into parts. Later the parts are joined, and there is more room for attention to details or to the overall musical and expressive goals as the movements themselves are controlled more automatically (Wulf, 2007).

The general assumption, then, is that in the first stage of learning there is a need for more conscious attention as well as verbal instruction and feedback. As the attentional and cognitive load lessens during the middle and later stages, the player is able to focus on things

not related to carrying out the task, or on a higher level of task focus, i.e. by focussing on expression. Many musicians approach the (learning) process by first learning technical skills and later focussing on musical and expressive aspects.

In Table 1.1, the stages of motor learning are outlined, the mechanisms are described, and the role of attention is highlighted. The table was composed by the author, and is the result of a compilation of the following sources: Altenmüller & Grün, 2002; Altenmüller, 2006; 2012; Hattie & Yates, 2014; Schmidt & Lee, 2005; Schmidt & Wrisberg, 2008; Squire & Kandel, 2009. Major research on motor learning referred to by the above sources includes: Adams, 1971; Fitts & Posner, 1967; Gentile, 1972; and Singer, 1993. Nomenclature differs amongst researchers, and some of the more common and descriptive examples are included in the table.

Table 1.1 Stages of Learning

Stage of Learning	Mechanisms	Attention
Early Stage **(Cognitive stage)**	Information is initially stored in the immediate (ultra-short-term) memory and moves to the short-term memory due to repetitive practice (no anatomical change) (Squire & Kandell, 2009). Translating declarative knowledge into procedural knowledge.	Use of language and words to direct action. Attention is on how the movement is performed: exploring, analysing and directing the body's movements (Adams, 1971; Schmidt & Lee, 2005). Memory load is heavy (Hattie & Yates, 2014).
Middle Stage **(Associative stage)**	Information shifts from short-term to long-term memory, causing long-term changes in synaptic connectivity – an anatomical change (Squire & Kandell, 2009). Consolidation occurs due to the strengthening of synaptic patterns between sensory and motor neurons. Memory load is reduced. A bigger shift from declarative to procedural knowledge.	The performer's concentration is more on patterns of movement and refinement of the skill (Newell, 1985). Attention shifts from directing movements to checking if the result fits the desired outcome.
Later Stage **(Autonomous stage)**	Consolidation is complete. Actions are well organised, reliable and involve large-sized chunks. Memory load is low as recognition is being activated.	Movements are produced with little or no conscious attention. Attention is on strategy or movement form or style (Schmidt & Lee, 2005).

Table 1.1 illustrates the stages of learning, the mechanisms involved and the role of attention.

It is generally believed that the early stage of learning involves verbal, declarative processing of information. In the middle stage, declarative knowledge is shifted to procedural knowledge as small movement skills are strung together. In the final stage, the movement occurs largely automatically (Adams 1971; Schmidt & Lee, 2005). In the following sections an alternative view about the role of attention during the learning of motor skills is presented. Contrary to mainstream beliefs (both in research and in music practice) is the idea that motor learning is best learned implicitly (Masters, 2012) and using external focus (Wulf, 2007).

How important are declarative processes to learning complex movements? Should people first understand what they are doing in a verbal cognitive way in order to achieve automaticity? The next section investigates this question by discussing and comparing explicit and implicit approaches to motor learning.

Explicit and Implicit Motor Learning

Explicit motor learning is defined as "learning which generates verbal knowledge of movement performance (e.g. facts and rules), involves cognitive stages within the learning process and is dependent on working memory involvement", whereas implicit learning is "learning which progresses with no or minimal increase in verbal knowledge of movement performance (e.g. facts and rules) and without awareness" (Kleynen et al., 2015, p. 2). As explained earlier in *stages of learning*, the cognitive load when learning something new is heavier than when the movement becomes more automatic. Questions arise concerning how much instruction and declarative knowledge to give a learner, and when it is appropriate to use explicit or implicit learning strategies. The main strategies used in sports and rehabilitation training include discovery learning, analogy learning, errorless learning, observational learning, dual task learning, trial and error learning, and movement imagery[15] (Kleynen et al., 2015)[16]. These are all strategies that are familiar to musicians; an added strategy would be auditory imagery.

Explicit learning involves conscious thinking and use of the working memory, and is usually operationalised by giving rules and instructions or by instructing the learners to find rules and instructions for themselves, and can be promoted by using various types of feedback. Implicit learning is better promoted by restricting feedback, by using an external focus of attention and by practicing the entire skill (Kleynen et al., 2015). Implicit learning (also called tacit learning) is a term coined by Arthur Reber in 1965. Reber claimed that implicit processes are more effective than explicit ones because they existed before the evolution of the cerebral cortex and consciousness. From an evolutionary perspective, long before people learned to talk they were still able to move effectively, and the implicit unconscious mechanisms that evolved were the most effective for survival. The development of verbal conscious functions and working memory meant that the necessity of the implicit mechanisms was not as great. Man has been described as being more reliant on conscious thinking processes (Reber, 1989;

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[15] Discovery learning would involve allowing learners to discover the rules themselves; analogy learning would involve presenting an analogy (e.g. image) to focus on; errorless learning involves learning in a way that no errors occur during practice (e.g. playing very slowly); observational learning means learning by observing someone else; dual task learning involves focussing on something else (e.g. counting backwards) whilst performing the skill; trial and error learning focuses on repeating the task, and noticing and responding to what works and what doesn't work; movement imagery involves imagining how the movement would look or feel.

[16] An interdisciplinary study about explicit and implicit motor learning.

1992). The questions that remain are: when, how and why should implicit learning be used instead of explicit learning, or can one use a combination?

The main considerations to be taken into account when deciding whether an explicit or implicit approach is appropriate are the type and difficulty of the task, whether the individual is a novice or expert, and the stage of learning. Many scientists and coaches believe that an explicit declarative stage is important for early stages of learning or with novices (as suggested by stages of learning models, e.g. by Fitts & Posner (1967) and by Schneider & Shiffrin (1977). Others claim that novices learn better with implicit methods and experts learn better when using rules and instructions (explicit methods). Schlapkohl & Raab (2016) described several studies on novices and expert athletes using both explicit and implicit approaches – the implicit approach used analogies (e.g. in a study involving table tennis players, the players were instructed to: "Try to move the arm as if you were throwing a discus"), and the explicit approach involved a set of instructions. The conclusions were that expert athletes benefit from rule-based instructions, whereas novices and pupils should be instructed implicitly (Schlapkohl & Raab, 2016, p. 39). Robert Singer is an example of those who believe that explicit methods are needed before and after making the movement, but that during the movement, an implicit approach is better. His 'five step approach' consists of: Readying, Imaging, Focussing, Executing and Evaluating (Singer, 1988). A more radical view has been taken by Richard Masters, who claims that it is important not to think about the movement while executing it, that instructions should be kept to a minimum, and that explicit learning is generally detrimental (Maxwell, Masters & Eves, 2000; Masters, 2012; Wulf, 2007). Since many of the views of Masters are in line with research on external focus, a review of Masters' implicit learning theory and his research follows here.

Masters' Implicit Learning Theory

Richard Masters claims that conscious thought can interfere with the automatic execution of a movement, and that motor learning should be primarily implicit in order to be efficient and to be reliable under pressure. His theory aligns with Reber's view that the older implicit processes lead to better learning and performance: "Implicit processes are embedded in neuroanatomical brain structures that phylogenetically are older and more sophisticated than explicit processes" (Masters & Poolton, 2012, p. 68, citing Reber, 1992). MacMahon & Masters (2002) describe explicit motor learning as a conscious process involving 'hypothesis testing': comparing internal thoughts with external facts and evaluating the success of the solution according to the movement-related feedback. The result is an accumulation of explicit knowledge in the form of rules and facts, which are stored in the long-term memory. According to Masters (2012), this form of learning is not only inefficient on the neural level, but also susceptible to error when the person is under stress. The phenomenon of referring back to declarative knowledge after automaticity is achieved is termed by Masters as

"reinvestment". Most sportspeople (and musicians) will recognise that thinking about how to do a movement during performance disrupts the flow and execution of that movement. Although verbal-analytical aspects of working memory activity may be gradually withdrawn during learning, the declarative knowledge that has been collected still remains available for retrieval, manipulation and application by the working memory (Zhu et al., 2012). Masters and Maxwell (2004) describe the Theory of Reinvestment as the retrieval and application of declarative knowledge during performance and cite wide-ranging empirical research that reveals that reinvestment is detrimental to performance (e.g. Baumeister, 1984; Bliss, 1895; Boder, 1935; Borkovec, 1976; Henry & Rogers, 1960; Reason & Mycielska, 1982; Weinberg & Hunt, 1976; Wulf et al., 2001). Masters' research reveals several causes for reinvestment, including the fact that some personality types are more prone to 'overthinking', psychological pressure, injury or fatigue, the availability for too much time for movement preparation, as well as unexpected events before or during a performance (Zhu et al., 2012).

Research on Implicit Learning

Most research on implicit motor learning has been carried out since 1992, and in many fields, including rehabilitation, child development and surgery, as well as sports (Masters & Poolton, 2012). Researchers have explored several ways to induce implicit motor learning: using secondary tasks, errorless learning, analogy learning, and marginal perception. Details of each of these and some results of the research are given below.

Using secondary tasks: the learner is thinking about something unrelated to the movement (e.g. counting backwards from 1000) whilst playing. The secondary task uses up a large proportion of the working memory (thus hampering hypothesis testing), leaving the main task to be carried out unconsciously.

Masters' early research on implicit motor learning in 1992 used a complex secondary task with novice golfers. Participants reported that they putted 'intuitively' (showing implicit learning). They performed better under real-life pressure situations than the other two groups (explicit learners and discovery learners) (Masters, 1992). This kind of dual task experiment has been replicated repeatedly with positive results (for an overview, see Masters & Poolton, 2012, p. 60). One disadvantage was that dual task learning was slower than the other two types of learning (explicit and discovery). When a simpler kind of dual task learning was tried (MacMahon & Masters, 2002), the results showed that hypothesis testing was not halted. The dilemma remained of how to have a secondary task that is complex enough to halt hypothesis testing without slowing down learning.

Errorless learning: the task is designed in such a way that the learner doesn't make mistakes (e.g. by starting on a very easy level and gradually getting harder). The assumption behind errorless learning is that if mistakes are never experienced, they cannot become ingrained or

familiar, and therefore not later retainable from the memory. An experiment involving beginner golfers and putting from very short distances, then gradually lengthening the distances, showed that they were more accurate (over a full range of distances) in a delayed retention test than a group that learned by first practicing over larger distances, and a control group (Masters, Kerr & Wheedon, 2001; Maxwell et al., 2001). In another study, when explicit instruction was added after the initial implicit learning phase, the players' performance remained stable (Poolton, Masters & Maxwell, 2005). More recently, there has been a great deal of research and interest in implicit motor learning using errorless learning techniques in rehabilitation and surgery (for details, see Masters & Poolton, 2012, p. 64).

Analogy learning: instead of giving verbal explanations, presenting a mental model of a new concept that is familiar to the learner (e.g. imagine the phrase 'cascading like a waterfall'). Analogies allow the individual to make inferences about concepts with little awareness of the rules that underlie the concepts (Donnelly & McDaniel, 1993). A great deal of research related to implicit learning has been carried out using analogies, with mostly positive results when compared to explicit learning. Studies on not only golf putting, but also tennis, table tennis basketball and other sports have shown that using analogies promotes implicit learning (e.g. Liao & Masters, 2001; Poolton, Masters & Maxwell, 2007; Koedijker, Oudejans & Beek, 2011). One problem with using analogies is that an analogy coming from a trainer may not always make sense to any particular individual – or be the most descriptive for the task. A solution could be to search for the most powerful/accurate analogy together with the learner.

Marginal perception: the information is presented to the learner so quickly that he/she doesn't consciously notice it, and yet it influences the behaviour (changes movements or posture without the subject being aware of learning). *Change blindness* is another form of marginal perception, where the task is made very gradually different (e.g. more difficult) without the learner realising. In experiments using marginal perception, feedback is withheld – often visual feedback, so that the player does not know the outcome and is forced to rely on unconscious awareness to detect feedback. An example of marginal perception and change blindness is as follows: a coach who wants to teach a volleyball player to learn to 'spike' normally brings the player's attention to trying to jump higher. Instead the coach could raise the net very slightly so that the player is not aware and is forced to jump higher without realising it. Then the net is raised a little more. Similar tactics could be used with musicians – for instance by slightly varying tempo or pitch (without telling the student) in order to stretch the musician's abilities without them 'knowing'. Other examples can be found in a study by Masters, Maxwell and Eves (2009) on (novice) golf putting. Similar studies have been done with tennis players.

Conclusions about research on implicit motor learning

Most of the studies on implicit learning that have been done on novices, in the field of sports, involve short timeframes and discrete movements (relevant for music, as music-making also involves discrete movements). More longitudinal studies are needed, as well as studies involving experts. The reason for the experimental designs that have been used is probably that it is easier to obtain clear quantitative results. Testing experts, testing field situations and testing musicians would be complex and involve many subjective elements. It is important to note that although many of the findings show that implicit learning leads to less performance decline when under stress (e.g. during a difficult performance), they don't show that the performance itself is better than that of explicit learners (Wulf, 2007).

Whilst it may seem logical to many that we need to mix explicit and implicit approaches and methods for learning and performing, depending on the nature of the task, the learner's abilities and the stage of motor learning (Kleynen et al., 2005), from the evidence of Masters and colleagues, it also seems likely that implicit learning could play a greater role in training motor skills. Apart from marginal perception, the above implicit learning strategies tested by Masters and colleagues are fairly common in teaching musicians. For instance, taking a slow tempo and learning short fragments (errorless learning), and using analogies and metaphors. Some musicians watch television while training with technical exercises (secondary task).

A key to the question of what approach is more appropriate in any given situation could lie in a deeper understanding of how cognitive load and task focus influence learning and performance. It would be important to look at the specific domain to be more sure about which approach is optimal, to adapt the concept of implicit learning to that field (design methods and strategies) and investigate its effect with longitudinal studies. In the case of music, this has not yet been done.

One important conclusion of the above research on implicit motor learning is that the mind should not be overloaded with declarative information – nor should it be overloaded with task irrelevant information. When the mind is not busy at all and the individual has too much time to prepare a movement, the result is not always optimal (Zhu et al., 2012). Therefore it seems that attention should be task-related and demanding but not based on rules and instructions or verbal-analytical processes. Gabriele Wulf proposes an elegant solution to finding complex task-related non-declarative focus – the use of external focus of attention. A recent theory by Gabriele Wulf and Rebecca Lewthwaite points out the importance of external focus to the debate of how to engage the conscious mind during motor learning.

The OPTIMAL Theory of Motor Learning

Wulf and Lewthwaite's OPTIMAL (Optimising Performance Through Intrinsic Motivation and Attention for Learning) theory of motor learning (Wulf & Lewthwaite, 2016) proposes that there are three keys to optimal performance, and that the combination of all three is the best approach to motor learning and performance.

Three Keys to Optimal Performance

In the OPTIMAL theory of motor learning, there are three conditions of practice that promote learning and performance (adapted for music pedagogy from Wulf & Lewthwaite, 2016):

- **Autonomy:** This means that the student should have choices. Rather than passively receiving instructions, a student needs to develop a sense of agency. Even small or incidental choices (e.g. what piece would you like to start with?) can have a positive effect on learning.
- **Enhanced Expectancies:** A musician's own beliefs and expectancies should be positive in order to learn or perform well. Mindset and self-efficacy play a part, as do success with challenging tasks and positive feedback.
- **External focus:** Instructions and feedback need to focus attention on the desired effect of the movements – i.e. musical intention (the expression that the musician wants to convey, including how it should sound). The result of this type of practice is that a musician is more focussed on the task itself – i.e. making music and expression. There is less focus on the self.

Wulf and Lewthwaite's theory suggests that autonomy, enhanced expectancies and external focus can each promote optimal learning, and that a combination of the three is even more effective. Together these three aspects can cause a "goal-action coupling" that results in less focus on the self, more focus on the task goal, and better learning and performance.

Figure 1.2 Schematic of the OPTIMAL Theory (Wulf & Lewthwaite, 2016)

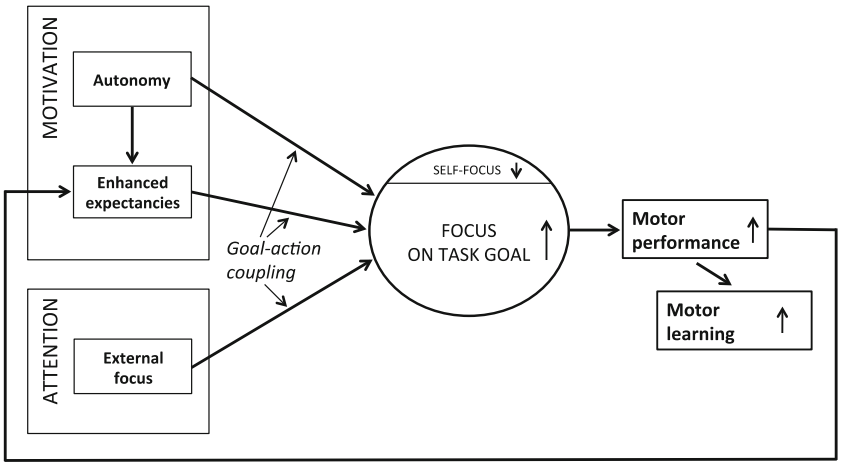


Figure 1.2 shows that the combination of autonomy, enhanced expectancies and external focus contributes to focussing on the task goal, and enhances performance and learning. The experience of a successful performance causes the player to expect further successes (enhanced expectancies), thus feeding back into the loop.

One of the significant things about Wulf & Lewthwaite's theory is the inclusion of motivation in a theory of motor learning, thus reflecting and implying how complex, multifaceted and holistic motor learning really is. The main significance and particular relevance to this research is the importance and influence of an external focus of attention. Masters' theories and research make clear that directing attention to co-ordinating one's movements (in a verbal-analytical way) is not optimal, and also that diverting the mind into secondary tasks (to prevent hypothesis testing) also creates problems for learning. Wulf proposes that the solution would be to direct attention to the intended goal of one's movements – which she calls external focus. According to Wulf, not only does external focus avoid the use of declarative processes, it also engages the player in a task-related focus, resulting in enhanced learning. External focus will be discussed in detail in the next chapter.

Motor Learning and Motor Performance for Music-making

As discussed in the introduction of the current thesis, musicians and their teachers use a wide range of teaching methods and strategies, but do not necessarily know much about how or why they work or don't work. Much of what goes on in the teaching and practice room is not monitored. General knowledge about how motor learning works is essential for the development of pedagogy – not only for young students but also in the conservatoire level, where musicians are being taught by experts with very individual approaches based largely on tacit knowledge, and little to no pedagogical training. Musicians spend many hours in the practice room, struggle with issues connected with motivation, confidence, and even injury. Performance is often accompanied by stressful feelings and performance anxiety. A better understanding of motor learning can bring not only more efficient and effective results, but also more confidence and joy in the process of learning. It is essential to know how to train

the mind i.e. when verbal-analytical processes are useful, and when and how to use implicit training methods.

If we apply the concept of implicit learning to musicians' motor learning we can argue that musicians need to rely less on analysing and directing their movements during learning (even in early stages), and certainly during performance. Proponents of the implicit learning theory do not advocate that learning and performance should occur without cognition. Conscious cognition can be useful and is required for planning strategies, choosing appropriate goals and monitoring the environment as well as reacting to unexpected events and communicating with the other players (e.g. in an ensemble). "Finding the right balance of consciousness during performance can be a constant challenge for performers. […] However, conscious control is often conspicuous by its absence when performers surpass their best" (Masters, 2012, p. 139).

Every performing musician has experienced moments, during a performance that is going well and fluently, when thoughts about *how* to play the next note or phrase have caused errors to occur. By thinking about what he is doing, the musician is no longer allowing implicit mechanisms to be in control. Implicit learning is enabled by using external focus and also by practicing the entire skill (i.e. not breaking it into components) (Kleynen et al., 2005). The question for a musician in the practice room or on stage: "What should I be consciously focussing on?" can now be addressed by investigating attentional focus and, in particular, external focus of attention.

2

Attentional Focus for Learning and Performance

Introduction: What do Musicians Focus on?

When asked, "What should you focus on during performance?" musicians often answer "On the music". Most will report that when they focus on themselves – on avoiding errors, steering their body's movements, thinking about the consequences of their performance, or when they have distracted thoughts – their performance suffers.

Two studies done at the Conservatoire of Amsterdam show some insight into musicians' attentional focus during performance. The first study by Buma, Bakker & Oudejans (2014) addressed the focus of elite performers and found that one of the main foci of attention was "music-related focus". A similar study on attentional focus of music students found that there was more focus on worries and disturbing thoughts than for the elite performers in the first study, and concluded that training in attentional focus can and should be offered at conservatoire level (Oudejans, Spitse, Kralt & Bakker, 2016). In an ethnographic study in 1987, William Trusheim interviewed 26 elite brass players – all members of leading American symphony orchestras – and found that they focussed on musical imagery in a multi-modal way (using auditory, as well as kinaesthetic senses) both during practice and in performance. He refers to their type of focus as "audiation" (Trusheim, 1991). Both audiation and Trusheim's study are discussed in detail in Chapter 3. Peter Keller (2012) also emphasises the importance of imagining the music by using anticipatory auditory imagery in music performance.

Clearly, thinking about "the music" is helpful for performance, as well as for learning, but what do we mean when we say "the music"? This chapter examines attentional focus in the context of learning and performing motor skills, explains the significance of external focus of attention and outlines the main research findings on external focus. The conclusion of the chapter connects the concept of external focus with focussing on "music".

What is Attentional Focus?

> *"Everyone knows what attention is. It is the taking possession by the mind in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought [...]. It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatterbrained state"* (William James, 1890).

Attentional focus (or concentration) is one of the most important aspects that influence the achievement of musical excellence (Connoly & Williamon, 2004; Chaffin, 2004; Keller, 2012) and excellence in motor skills in general (Wulf, 2007). Focus can involve the senses

e.g. sight, hearing, touch, smell or taste, or a combination thereof. Musicians typically rely on their visual, auditory and kinaesthetic senses when they focus – or on an emotion. Attention can be on what is in the past or present, or on an imagination of something in the future. It can be either narrow or broad, related to the task at hand or to something else, be based on the intended outcome or on the outcome that one fears. Focussing attention involves choosing what to focus on as well as what not to focus on. The different types and aspects of attentional focus are described in the following section.

Types of Focus

Focus can be categorised in several ways. Below is a hypothetical categorisation and model (formulated by the author) that describes five dimensions of attentional focus.

Dimension 1 involves task relevance – associative focus versus dissociative focus. Associative focus refers to focussing on the task itself and can include monitoring of bodily sensations (e.g. "my finger movements are relaxed/cramped"; "my breathing is deep/shallow"; "I can feel the keys with my fingertips"), or thoughts that include internal commands or instructions (e.g. "relax my shoulder"; "make a crescendo here"; "keep the rhythm steady"). Other types of focus relevant to a musician's task are noticing the sound of the music and/or how it feels or using imagery – to imagine how a phrase could sound or feel, or what it is expressing. Dissociative focus involves thinking about things that are unrelated to the task at hand and could include noticing things in the environment that are irrelevant to the task, or reflection on past events and planning for future events. Focus on the self (e.g. judging oneself or thinking about the judgement of others) or on the consequences of a performance, are also forms of dissociative focus and have been found to be detrimental to performance (Kenny, 2011). Focussing outside of the immediate task brings one out of the task, making it difficult to adapt or react to any changes in the environment. Optimal or 'peak' performance is often accompanied by a "flow state" of consciousness where performance is "an almost automatic, effortless, yet highly focussed state of consciousness" where the performer's concerns about success and even sense of time is absent (Csikszentmihalyi, 1996, p. 110).

Dimension 2 refers to the direction of the focus – internal versus external focus. Internal focus is giving attention to the body's movements (e.g. my arm, fingers, breathing) and external focus is on the result or effect of the movements (e.g. the sound, the phrase, the music) (Wulf, 2007; Wulf, 2013). Both internal and external focus can refer to what is actually happening or it can be on the intention or anticipation – imagining what is about to happen. External focus is explained in detail in the next section.

Dimension 3 is whether the focus is positive or negative. A further dimension of attentional focus that is connected to anticipating a result is whether the player is focussing on something

positive (e.g. the sound or effect he wants to make) or something negative (e.g. the mistake he wants to avoid). This relates to focus on self or on consequences (see above). The "flow state", mentioned earlier, is accompanied by positive emotions. Focussing on what you *don't* want makes it more likely that the (unwanted) result will happen – this has been called the ironic effect (Wegner, 1994). Many a musician has experienced bad results when focussing on not making mistakes.

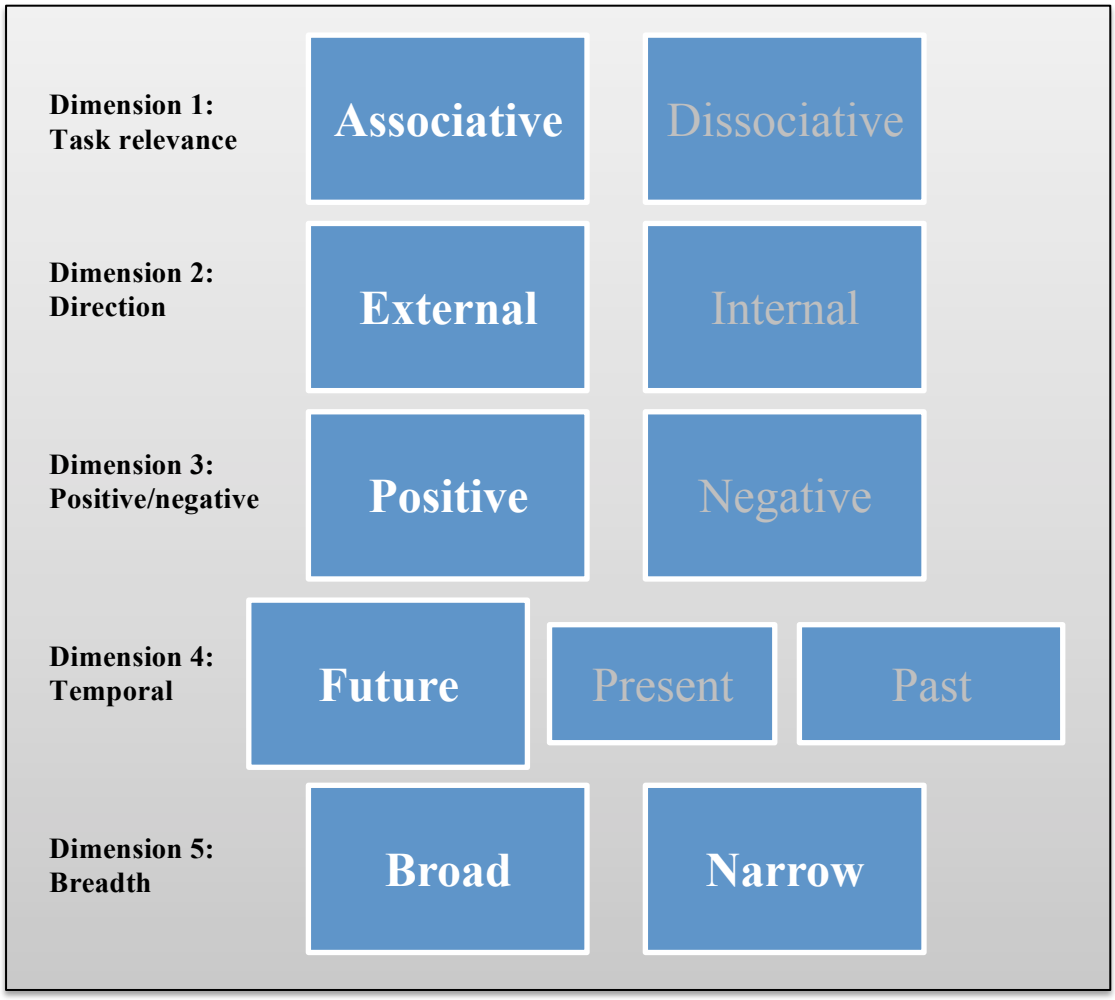
Dimension 4 refers to the temporal dimension of focus. The temporal dimension of focus – whether focus is on something occurring in the present moment, on something that occurred in the past, or on something that the player is intending, or anticipating – is of crucial importance to this research. A player could be focussing on something that is occurring in present time (e.g. the sound or phrase he is making, or the movements of his body, or the sound of the ensemble), or in the past (e.g. what just happened or happened in a previous performance) or in the future (e.g. the sound or phrase he is about to make). Masters pointed out that focussing on what has already happened leads to hypothesis testing and analysis. Focussing on what is about to happen is anticipating a result, and is a crucial aspect of external focus (Keller, 2012; Wulf, 2007).

Dimension 5 refers to the breadth of the focus: Focus can also be broad (e.g. paying attention to a wide range of sensations, thoughts, feelings and sounds associated with the performance; listening to the ensemble) or narrow (e.g. listening to your own sound; noticing a particular sensation) (Connolly & Williamon, 2004; Nideffer, 1976; Schmidt & Wrisberg, 2008).

Table 2.1 illustrates dimensions of focus in a hierarchical way and highlights the most effective focus for motor learning. Based on the literature cited above, for optimal results, focus needs first to be related to the task (be associative) and on the intended goal – meaning it is external, positive and anticipatory. Both broad and narrow focus are recommended.

External focus falls into all of the recommended categories listed in Table 2.1 – i.e. it is associative, positive, anticipatory, and can be broad or narrow (see the following section on external focus).

Table 2.1 Five Dimensions of Attentional Focus
(recommended focus shown in white letters)



Limitations of Attentional Focus

Attentional Capacity, Attentional Span and Level of Arousal

An important aspect of attention to consider is that it is a limited resource – limited both by how much information we can process at any given time or how many things we can pay attention to at once (attentional capacity), and by how long we can sustain our attention (attention span) (Schmidt & Lee, 2005). Our ability to focus attention is also affected by our level of arousal and our ability to manage arousal and anxiety (Schmidt & Wrisberg, 2008). Attentional capacity and span differ from individual to individual (and from day to day) and are subject to many factors including age, the subject of the attention (how "interesting" it is), tiredness, and the individual's ability to regulate attention (e.g. being able to ignore things that are irrelevant to the task) (Hattie & Yates, 2014). Attentional capacity, span and the effects of arousal on attention are dealt with in more detail in the following sections.

Attentional Capacity

Attention can be defined as, or measured by, the degree of interference between two tasks (Schmidt & Lee, 2005). For this reason, much of the experimental research done on attention and motor learning involves testing someone's ability to do a task whilst performing a second task simultaneously. The ability to perform a task whilst doing a secondary task indicates how automatic (learned) the first task is. In the case of Masters' research on implicit motor learning, a secondary task was often used in order to take the person's mind off consciously thinking about the skill that was being learned.

One of the reasons we try to simplify a task is to reduce the cognitive load – the amount of mental effort involved. If the working memory is trying to process too much at once, learning and performance is hampered (Sweller et al., 1998; Van Gog et al., 2005; van Ketel, 2017). The difficulties of processing too much complex material or thinking about too many things at the same time are addressed by cognitive load theory. It seems that not only the type of focus but also the amount of information and how it is presented has an influence on learning and on performance. John Sweller developed the cognitive load theory in the 1980s and explained that the load on someone's cognition can be intrinsic (i.e. it is a difficult task requiring much effort), extraneous (referring to how the information is presented), as well as germane (referring to how much effort it takes to make sense of the information and store it in the brain for later retrieval) (Sweller et al., 1988).

As was implied in the section explaining the stages of learning, managing cognitive load (also referred to as memory load by Hattie & Yates, 2014) is particularly important during early ("cognitive" and "associative") stages of learning. When a task is well learned (autonomous stage of learning), presumably there is 'space' left over in the mind – either for more task-related focus, or for distraction or interfering thoughts.

Attentional Span

Attentional span refers to how long one can focus attention for before being distracted. Attention wanes over time – the amount of time most likely depends on the individual, the demands of the task and on how interesting or important it is and "what the individual brings to the situation" (Briggs, 2017). Studies on attention indicate that intensive mental focus drops off after only 10 minutes (Hattie & Yates, 2014). There are two major theories that try to explain this. The first – the *ego depletion theory* – describes a depletion of energy (Baumeister et. al, 1998). This theory posits that the ability to focus intensively is subjected to biological exhaustion. The second theory – called *cascading inattention* – describes the process of too much information causing confusion and overload (Risko et. al, 2012; Hattie & Yates, 2014).

Because we all have limited attention span (a limited amount of time that we can focus intensively in a day) most sports trainers (as well as instrumental music teachers) recommend distributed practice – practicing for short periods of time several times a day rather than one or two long sessions (Schmidt & Wrisberg, 2008). The best scenario would be that players themselves notice when attention begins to wane and act accordingly (e.g. by finding a way to make the task more engaging or taking a break).

The Effects of Arousal and Anxiety on Attention

As many musicians have experienced on stage, the ability to focus attention can be affected by arousal[17] and anxiety. One of the most popular topics amongst musicians is how to manage performance anxiety. A certain amount of arousal can be beneficial to performance, but when it is too high it can result in anxiety and fine motor control (needed to play or sing music) can be impaired as a result. Research suggests that when someone knows (or imagines) they are being judged or evaluated during a performance they usually experience anxiety (Wrisberg, 1994). Both in the early stages of learning and even during performance, anxiety and arousal can cause someone to shift their focus inwards – from external to internal focus (Wulf, 2007; Schmidt & Wrisberg, 2008). Managing arousal and stress is therefore of paramount importance for all performers and can be facilitated by focussing on the task rather than on the outcome (thus also avoiding self-focus) and by using an external focus of attention (Schmidt & Wrisberg, 2008; Kenny, 2011).

Optimal Focus for Learning and Performance

The current study is about what we should do with our conscious minds during practice and performance. The conclusions we can draw from the above information about the nature of attentional focus are that verbal instructions should be limited during learning and that during learning and performing a person should fill their mind with task related external focus – a type of focus that has less cognitive load than verbal instructions and internal focus. The following section explains external focus in detail.

[17] Arousal is the level of activation of the central nervous system (Schmidt & Wrisberg, p. 224).

External Focus of Attention[18]

External focus is being mentioned more and more by sports coaches and motor learning experts as the most effective type of focus for learning and performance. "Research examining the optimal attentional focus for skill learning suggests that people who are instructed to focus on the intended environmental effects of their actions (i.e. an external focus) perform and retain (i.e. learn) target skills more effectively than those who are told to focus on the movement itself (i.e. an internal focus)" (Schmidt & Wrisberg, 2008, pp. 224-225). External focus refers to the person's concentration and not their visual focus (Wulf, 2013).

The definition of external focus for the current thesis is: ***Focussing on the intended effect of one's movements***. The following section describes the main findings relevant to the current study from research on external focus, theories on how external focus works and the implications for musicians.

Research on External Focus

Most of the experiments investigating external focus compare it with internal focus and/or with control conditions (where no focus is stipulated), and findings are overwhelmingly in favour of using external focus both for learning – even in early stages – and for performing various types of complex motor skills. Where there is some nuance is how distal the focus needs to be for a particular skill level. A comprehensive overview of research on external focus can be found in Gabriele Wulf's *Attentional focus and motor learning: a review of 15 years* (2013).

The first reports on the benefits of external focus were made in 1998 as a result of studies made by Wulf, Höß and Prinz using a ski-simulator task. Subjects were asked to focus on either their feet (internal focus), or on the pressure exerted on the wheels of the platform on which they were standing (external focus). A second study made by the same researchers was similar, but involved using a stabilometer, which the subjects tried to balance on, again using either internal or external focus (Wulf, 2013).

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[18] *Contradictory terminology*
In the last 15 years, research on attentional focus has increased and broadened. The literature now contains much, sometimes contradictory, terminology that can lead to some confusion and communication problems. 'There are two largely separate branches of research studying attention in human performance that are (a) using identical language to describe different constructs and (b) do not integrate research from the other branch into their operational definitions, hypothesis or theories' (Lohse & Sherwood, 2011, p. 2). Lohse & Sherwood describe in detail the problem of definition and classification of types of attentional focus amongst researchers and the need for more coherence. The result of the discrepancies is that the terms associative and dissociative are sometimes interchangeable with external and internal, and may or may not include task relevance. External focus is understood by some (e.g. Nideffer, 1976) to mean focussing on environmental cues and by others (e.g. Wulf) to mean a focus on the intended effect of an action. The current study is based on Wulf's definition of external focus.

Many experiments followed from Wulf and colleagues as well as others, involving balance tasks and movements from sport disciplines such as golf, volleyball, soccer, basketball, tennis, throwing, juggling, gymnastics, athletic sports, muscle training, and swimming, as well as from music, e.g. piano playing. Thus a variety of simple and complex movements were tested. Studies were carried out on novices as well as experts. Different distances of external focus were tested. Positive effects of external focus have been found for both effectiveness and efficiency of movement, on both self-efficacy and the speed of learning, for beginners as well as experienced players, and for simple as well as complex movements.

External focus has been found to benefit both performance and learning. Experiments on external focus repeatedly found that there was not much difference between internal focus and control conditions (Wulf, 2013). The main findings from the results of experiments on external focus are listed, described and discussed below, all of which have relevance to musicians and to this study.[19]

A Summary of the Main Findings on External Focus

External focus is better than internal focus for effectiveness and efficiency of both simple and complex movements.

Most studies on external focus have measured its effects on effectiveness or efficiency, and a few have measured both. Movement effectiveness refers to aspects such as balance and accuracy. Many of the trials carried out by Wulf and others have shown that external focus enhances these aspects. Similarly, movement efficiency (achieving an effective movement with less expended energy) benefits from external focus. Aspects such as force production, speed and endurance and movement kinematics (whole body coordination) are included in this category (Wulf, 2013; Wulf, 2007; Wulf & Lewthwaite, 2016).

Both learning and performance are affected positively by external focus.

Improvement in performance refers to an immediate effect, shown by an improvement during a practice phase, whereas learning refers to a more permanent change in a person's skill level. Learning can be measured by retention tests (after a period of time has elapsed) or by transfer tests (to see if a skill transfers to similar ones, or is still there without instruction). An example is a study by Wulf & McNevin (2003) where participants practiced a complex balancing task (holding a tube horizontally with a tennis ball in it, whilst balancing on a stabilometer) over 14 trials. The internal focus group was asked to focus on their hands, and the external focus group on the tube. Results showed that the amount of errors made was lower for the external focus group throughout the trial period, over four retention tests as well as three transfer tests. An

[19] A discussion of the data and details of each study is beyond the scope of this dissertation. For a full review see Wulf, 2013.

implication of high success rates for transfer tests is that external focus creates a mechanism that enables adaptability – something that is very valuable in field situations.

External focus is beneficial for beginners as well as more experienced players and for children as well as adults and also for people with motor impairments.

These findings support Masters' claim that even at the early stages of learning, thinking about how you are producing a movement is not beneficial. Contrary to many expectations, empirical research has found that both novices and experts benefit from external focus. Many teachers and coaches as well as scientists believe that beginners need to go through a cognitive stage (see Table 1.1: Stages of Learning) where they pay attention to how a movement is achieved. Later, when the movement is more automatic, the attention can shift outwards. Several studies on external focus convincingly contend the idea that early stages of learning should be dominated by declarative learning (Wulf, 2013; Wulf & Mornell, 2008). An example is a study with both novice and experienced players practicing a volleyball serve, where both groups performed better with external as opposed to internal focus instructions. The instructions themselves were worded only slightly differently (e.g. "Shift your weight toward the target" versus "Shift your weight from the back leg to the front leg"), and yet produced clear difference in result (Wulf, McConnel, Gärtner & Schwarz, 2002).

The more distal the external focus, the better it works – especially for experts.

An important question when deciding on the "right" focus to use is "how far out should the focus be?" Several studies (first demonstrated by McNevin et al., 2003) found that the more expert the performer is, the further out the focus should be (Wulf, 2013). For this reason it could be important for an individual to find the appropriate "optimal" distance of focus for a particular task. Focussing too close or too far out from the optimal focus can degrade performance and learning. "Thus the optimal attentional focus depends on the level of expertise" (Wulf, 2007, p. 150). In her book *Attention and Motor Skill Learning*, Wulf describes different levels of control: during an early stage of learning, performers tend to monitor their actions by choosing a "lower level of control" – for instance by monitoring muscle control. In later stages – when the player has gained enough experience – the goals and focus represent a "higher level of control", e.g. a strategic aspect of winning the game – leaving the body's co-ordination free to function implicitly. Interestingly, when under pressure, performers can tend to "choose a lower than necessary level of control", which can result in a drop in performance level (Wulf, 2007, p. 150). An understandable reaction to an important or demanding performing situation is that performers try to control their movements consciously and not trust the automaticity of the skill.

External focus promotes higher self-efficacy.

Self-efficacy (a person's belief in their ability to learn) is known to have an effect on motor performance (Moritz, Feltz, Fahrbach & Mack, 2000). The finding that focussing externally can have a positive effect on self-efficacy was shown in a study where participants' ratings of

their confidence were measured (Pascua, Wulf & Lewthwaite, 2015). Self-efficacy in turn promotes better learning. The relationship between motivation, external focus and enhanced learning and performance is described in Wulf and Lewthwaite's OPTIMAL Theory (see Chapter 1).

External focus is effective regardless of being preferred.

Wulf also points out that regardless of whether a performer's preference is for another type of focus, external focus brought better results (Wulf, 2013). Many sportspeople and musicians enjoy using internal focus – possibly because it gives them a sense of being in control.

External focus can help to avoid performance anxiety.

Focus on the self is a strong contributor to performance anxiety (Kenny, 2011). "[…] focus on the self can be induced through instructions, feedback, or an individual's conceptions of his or her ability – tends to have detrimental effects on performance." (Wulf & Lewthwaite, 2009, p. 110). External focus is task focus, and reduces focus on the self. A lot of research suggests that self-focus hampers both motor performance and learning, and that internal focus is connected with focus on the self (Wulf et al., 2009).

Experiments on external focus.

Most of the experiments carried out on external focus cited above included several trials over one or a few days, and most involved novices (beginners) – presumably because the results can be compared more easily if everyone starts off at the same level. Carefully worded instructions were generally used to differentiate internal and external focus (e.g. "to strike the ball, the swing of the leg should be as long as possible" (internal focus) versus "To strike the ball, create a pendulum-like motion with as long a duration as possible" (external focus). See Wulf, 2007, pp. 62-65; 99 for more examples. Most experiments included a retention test (at least one day after the last trial) in order to see whether learning had occurred, and some also included transfer tests in order to see if the skill learned transferred to other variations of the skill. A recent study made by Mornell & Wulf (2019) on expert musicians is explained in detail the section "Research on External Focus and the Performing Arts" below.

More longitudinal studies would shed further light on how best to use external focus and adapt it to different fields, movements and individuals. The literature leaves little doubt that external focus is a better way of learning than either internal focus or avoiding thinking about the task altogether. Further research could test the effects of external focus over longer periods of time, address how to choose a suitable distance of focus for a particular situation or individual, and apply and test the concept of external focus in (complex) field situations. More detailed experiments on experts would add to how we understand the effects of external focus. Most of the skills tested in the research on external focus were discrete skills. More research is needed to see how external focus affects serial skills, e.g. gymnastic routines or

music-making. The fact that there is very little research on the effects of external focus in the performing arts is discussed later in this chapter.

There are some studies that claim that external focus is not more effective than internal focus (e.g. Poolton, Maxwell, Masters & Raab, 2006), or that novices benefit more from internal focus (e.g. Perkins-Ceccato, Passmore & Lee, 2003). However, these claims are challenged convincingly in Wulf's review, where she points out methodological weaknesses (for instance unclear instructions given to the participants) (Wulf, 2013, pp. 91-95). To the author's knowledge, there is as yet no robust empirical evidence to show that internal focus can be more beneficial than external focus for motor learning and performance.

Explanations for and Mechanisms behind External Focus

External focus allows a more overall whole-body co-ordination (movement kinematics), and seems to create more freedom of connection between the various body segments resulting in a more elegant, optimal overall movement, and less muscular effort (Wulf, 2013, p. 89).

The reason for the kind of efficient mechanisms described by Wulf is that implicit learning is going on whilst the mind is engaged by focussing on the intended movement result. It seems that focussing on the intended result frees the motor control systems to function implicitly, thus enhancing the process of learning, and triggering a quicker and more accurate response during performance. Directing attention away from the body's movement also results in directing focus away from the self. According to Wulf's theories as well as those of Diana Kenny, focus on the self is a disturbance to motor performance (Kenny, 2011).

Wulf's constrained action hypothesis is an attempt to explain the mechanisms behind external focus. Below is an excerpt from Wulf (2007), p. 114.

Constrained Action Hypothesis

- Focussing on one's movements (i.e., adopting an *internal focus*) constitutes a conscious intervention into control processes that would "normally" regulate movements effectively and efficiently. That is, trying to actively control those movements disrupts automatic control processes.
- Focussing on the movement effect (i.e., adopting an *external focus*) promotes a more automatic type of control. It takes advantage of unconscious and reflexive processes and allows them to control our movements to a greater extent. As a result, performance and learning are enhanced.

Wulf does state that the exact underlying mechanisms behind attentional focus need more investigation that could include looking at how brain activity changes when shifting from one focus to another (Wulf, 2013).

Research on External Focus and the Performing Arts

As yet there is very little research on the effects of external focus on performing artists. There are several reasons for this. One is that judging an artistic performance is subjective. Errors are often too subtle to perceive or measure, and opinions vary between judges about what is a good performance. Making music and dancing are activities that are difficult to regulate to laboratory conditions as they involve an extremely complex series of tasks and movements. Most of the experiments carried out by Wulf and colleagues involved novice learners – people attempting tasks they have not done before, making the interpretation of the data straightforward. One of the crucial issues for scientists researching in the performing arts is: "What are we measuring?" (Schmidt & Lee, 2012). The following section is a brief review on the few studies that research attentional focus for musicians: Duke, Cash & Allen, 2011; Atkins & Duke, 2013; Atkins, 2017; Mornell & Wulf, 2019.

An example of the type of experiment conducted by Wulf being replicated for musicians, was one undertaken by Duke, Cash & Allen (2011), where a study was carried out on musicians using a piano keyboard task. The subjects were instructed to focus either on their fingers (internal focus), the keys (external focus), the piano hammers (more distal external focus), or the sound produced (even more distal external focus). The researchers concluded that not only was external focus more effective than internal focus (i.e. the speed at which a participant could play a 13-note sequence of two alternating notes), but also that "the more distal the focus of attention, the more accurate the motor control" (Duke, et al., 2011, p. 4). Most of the previous research on external focus relied on visual or kinaesthetic feedback (e.g. focus on your feet; focus on the target). In this study, the feedback for the external focus instruction was auditory focus (focus on the sound), indicating the potential benefits of external focus for musicians. The study, however, tested a simple two-finger movement (and not a piece of music), and used subjects who were musicians, but most of whom were not keyboard players. Most of the subjects were therefore novices on the keyboard. It is significant that there were only two keyboard players in the study and neither of them showed any improvement in speed or accuracy. The likely reason for this is that the level of difficulty was too low to show any differences. Wulf (2012) emphasises the importance of testing motor tasks that are sufficiently challenging for improvements in speed and accuracy to be discerned. In addition, the task was not a musical one, but merely a finger movement exercise. Sound was produced and auditory feedback was involved, but sound production on its own is not music, so music-making was not tested in this study. Two other studies (Atkins & Duke, 2013; Atkins, 2017) tested the effects of and external focus instructions with singers. Atkins & Duke (2013) gave a group of novice singers internal (focussing on vibrations in their throat) and external (directing sound to their fingers on their nose or the microphone or a point on the wall) foci whilst singing a three-note sequence on one vowel. Expert ratings showed that the tone quality was better with external focus. Atkins (2017) asked expert singers to focus on their soft palate (internal focus)

and on various distances (external foci). Results of this study also found that tone quality was better with external focus and that distal external focus was more effective than proximal external focus.

Anemone Van Zijl carried out research that investigated what kind of focus facilitates an expressive performance (Van Zijl, 2014; Van Zijl & Luck, 2013). Instrumentalists were asked to play a segment of music by first using technical focus, then expressive focus[20], and then focusing on feeling the emotion represented in the music. The research was carried out using a multi method approach that measured the performers' movement, an analysis of audio data as well as the perception of the audience. Findings showed that focus on expression gave a higher impression of skill and a more extroverted performance than focus on technique. Van Zijls findings suggest that focusing on musical intention can improve a performer's technical ability during performance compared to focusing on technique.

In a very recent study by Adina Mornell & Gabriele Wulf (2019), skilled musicians were asked to perform a prepared piece by using internal focus (focusing on their fingers, or in the case of singers – their lip movements, and on correct notes), and external focus (on playing for the audience and focussing on the expressive sound of the music) as well as a control trial, where they were not given any instruction. Expert raters were asked to judge the technical quality as well as the musical quality of each performance.

In their first experiment, the statistical results showed that external focus lead to better musicality but not necessarily to greater precision. Their second experiment was an improved design that involved better counterbalancing within the trials, had three rather than two expert raters with more specific criteria for rating and performers were given a 'warm up' before the first trial. It was also simpler in that all the participants did not involve singers (or brass players) so they could all be asked to focus on their fingers in the internal focus trial. Results confirmed those of the first experiment – that external focus led to better musical expression and in addition showed positive statistical results for external focus benefitting technical precision.

Mornell & Wulfs' experiments went a step further than the previous studies in that all of the participants were skilled musicians and there was a variety of instruments represented (piano, violin, clarinet, percussion, cello, tuba, horn, voice) and it involved playing complex music and not only a short sequence of notes. Musical expression and not only technical precision was tested.

[20] It is interesting to note that Van Zijl considers feeling emotion to be internal focus. This author would categorise it as external focus as it is to do with the intended effect of the performer's movements and not the movements themselves. This is another example of the ambiguity of the terms internal and external focus.

In all of the aforementioned studies the effects of attentional focus were tested primarily on musical performance and not on the learning process; all were designed to test internal versus external foci and on one fragment or piece of music. Participants were given specific instructions on what to focus on. In all four studies, external focus was found to be more effective on performance than both internal focus and control conditions, and distal external focus was found to be more effective than proximal external focus. The interpretation of internal and external focus is possibly problematic in all four studies. Being instructed to focus only on throat vibrations, soft palate or on fingers is not necessarily what musicians would normally do or be instructed to do and would be difficult for a musician – especially when performing – to be able to do. Similarly some of the interpretations of external focus (for example 'on correct notes' or 'playing for the audience') could be contentious or misconstrued (for instance focussing on correct notes could be seen as external focus – focussing on playing for the audience could be interpreted as pleasing the audience and lead to self-focus).

One of the questions, therefore, for scientists who want to study the effects of external focus on performing artists is: "How do we translate the concept of external focus to the domain of music?"

A clue to answering this question is suggested by a study about external focus and ballet dancers (Guss-West & Wulf, 2016), where it was suggested that performers could focus on images, analogies, or metaphors in order to induce a distal external focus (p. 24). This type of focus makes sense also for musicians as it provides a rich representation of the effect they want to make – not only the resulting sound but also what it represents or feelings it could evoke.

External Focus for Music-making

This thesis is an inquiry into the possible benefits of using external focus for musicians during learning and performance. The research carried out by Gabriele Wulf described above has shown how external focus can be used in the fields of sports and rehabilitation. Research in the performing arts suggests that external focus can improve finger movement (Duke et al., 2011), dance (Guss-West et al., 2016), (vocal) sound quality (Atkins & Duke, 2013; Atkins, 2017) and technical proficiency as well as musical expression (Mornell & Wulf, 2019). The scarcity of empirical studies on external focus for the performing arts was one of the main motivations for the current study. Deeper investigations into the possible benefits and the manner in which we can interpret external focus for musicians are required.

In order to find out what are the effects and possible benefits of external focus for musicians' learning and performance it is necessary to ascertain what external focus is for musicians. For a golfer for instance, focussing on the movement of the golf club is a form of external focus; he is focussing on the effect of his body's movement. Focussing on the desired trajectory of the ball would be a more distal form of external focus. For a musician, focussing on the

movement of the keys or objects (e.g. the bow) is one way of using external focus and has been suggested by Wulf and by Duke et al. Wulf also suggested focussing on the desired sound or mood of the music (Wulf, 2007, pp. 62-65). The suggestions from the research of Guss-West and Wulf suggest that using metaphor and analogy is a form of external focus (for a musician this could apply to, for example, the keys or to the sound) (Guss-West et al., 2016). Kenny (2011) suggests that for musicians, external focus would be on the sound produced.

Table 2.2 lists some examples of internal focus, external focus, distal external focus and very distal external focus as applied to musicians.

Table 2.2 Internal and External Focus for Musicians

Internal focus	External focus	Distal external focus	Very distal external focus
Movement of the fingers	Movement of the keys	Imagining the desired sound/reverberation	Imagining the meaning of the music
Movement or position of the arm	Movement of the valves		Imagining a picture, analogy or metaphor connected with the music
Force produced by the arm	Movement of the bow		Imagining the mood or emotion behind the music
Embouchure muscles, lip pressure	Movement of the hammers		Imagining the rhetorical expression of the music
Breathing mechanism, force or speed of air	Movement of the stick/s		Imagining a narrative or story connected with the music
Posture			
Position of larynx, soft palette, tongue			

Table 2.2 illustrates ways of focussing internally and externally whilst playing or singing music – including examples relevant for a stringed instrument a keyboard instrument, a wind instrument, a percussion instrument, or for a singer.

Information about and research on external focus is dominated by the work of Gabriele Wulf and has only relatively recently (in the last 10 years) generated a great deal of interest in the domain of sport. Wulf's research is convincing for the reason that it is has been rigorously carried out in a variety of scenarios. The claims made by researchers who advocate using external focus rather than internal focus resonate with what many high-level performing artists intuitively believe or have noticed – that focussing on the desired effect or result helps to be "in the music" and does not disrupt the process by thinking about it whilst playing: "Has it ever frightened you to play, and watch your fingers moving, and not know who it is that is making them move?" (Vladimir Ashkenazy talking to Richard Masters: Masters, 2014).

Although learning through declarative processes involving analysis and internal focus has become mainstream practice in music lessons, many musicians prefer to rely on their intuition and on unconscious processes. The books *The Inner Game of Tennis* (Gallwey, 1974) and its musical version *The Inner Game of Music* (Green & Gallwey, 1987) advocate building awareness and avoiding critical analysis and judgement, and have been an inspiration to many

musicians. Research since that time – for instance on external focus – has provided a clearer understanding of how and why we can focus more effectively.

3

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).
>
> *"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.

Summary of Part I

Part I presented a theoretical background for motor learning and how it relates to musicians, discussed implicit learning and attentional focus – in particular external focus of attention – and explained how external focus could relate to music-making in the form of audiation and musical imagery. The conclusions are summarised here.

Making music involves motor skills that are too complex to fully understand or control consciously. It seems likely that much of the verbal 'declarative' processes that are often used in learning and teaching could be effectively replaced with a more procedural approach (even in early stages of learning), for instance by using an external focus of attention – focussing on the intended effect of one's movements. One way to focus externally could be with audiation – by using vivid anticipatory auditory imagery. The audiation experience could be further enhanced if the musician also practiced singing, gesturing, and varying the phrases or fragments of music.

According to the research findings cited in Part I, one could expect that applying external focus to musicians would result in an enhanced ability to play and perform music – both technically and artistically.

Part II follows with a description of three empirical projects designed to explore the use of external focus – in the form of audiation – in contexts involving musicians' learning and performance. The section includes a description of the design and implementation of a practice tool based on audiation: APT (Audiation Practice Tool – based on the concepts described in Chapter 3) that was used in all three projects.

PART II: FOCUSSING ON MUSICAL INTENTION

Three Empirical Projects

Playing accurately and with confidence is the goal of all performing musicians – including natural trumpet players. As the natural trumpet (see Fig. 0.1) has no mechanisms, the movements required to play it can't be seen and easily monitored. Mastering natural trumpet playing requires that the player has a precise control of the form and speed of the airstream. A slight deviation results in a 'cracked' note or even a different note than the intended one, and even experienced players are prone to making audible mistakes in performance. The fine motoric skills that are required are too complex to control and steer consciously, making natural trumpet playing a good example of an activity that can suffer when the player uses internal focus. Factors that can affect the result include skill level, difficulty of the music, and the level of arousal (nervousness) of the player. As discussed in the previous chapter, the crucial question for the player is, therefore, "on what should my attention be focussed in order to achieve the optimal and reliable result?" What the player focuses on directly before and during playing could either help or hinder the desired outcome. This applies to both the learning process (practicing) as well as during performance.

In the previous chapters, literature was discussed that led to the conclusion that using an external focus of attention (focussing on the intended effect of one's movements) is more beneficial than either focussing on directing the movements themselves or being occupied in analysis or judgement during playing. Studies in sports and movement sciences showed positive results for movement effectiveness[23] (including accuracy), efficiency[24], movement form[25], and automaticity[26] (Wulf, 2013).

Self-efficacy can also be positively affected by external focus (Pascua, Wulf & Lewthwaite, 2015). Benefits have been found to affect both beginners and more experienced people, and in early as well as later stages of learning. The great majority of studies have been in the field of sports. A study by Guss-West and Wulf (2016) about ballet dancers argued that although external focus was preferable to internal focus for enhancing movement effectiveness and efficiency in dancers, only 27% of the 53 international professional ballet dancers surveyed reported using external focus instructions in their coaching.

Apart from the studies made by Duke et al. (2011), Atkins & Duke (2013), Atkins (2017) and Mornell & Wulf & (2019) (see Chapter 2), no significant studies have been made investigating the possible benefits of external focus for musicians' learning and performance.

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[23] Movement effectiveness refers to how accurate and consistent the outcome of the movement is.
[24] Efficiency refers to the amount of physical and mental effort and energy expended.
[25] Movement form refers to the way a movement is performed.
[26] Automaticity refers to the stage where a movement requires little conscious thinking.

As already mentioned, Duke's study (2011) involved testing a simple finger movement and not complex music-making; Atkins & Duke (2013) and Atkins (2017) also tested using a short fragment of a few notes. Mornell & Wulfs' study compared internal and external foci for music performance involving participants each playing a complex piece of music. The current research was motivated by the desire to introduce explicit external focus methods to naturalistic music-making contexts. The three studies presented in the following chapters were designed to see how external focus affected musicians in three increasingly complex field environments that also involved learning.

4

An Overview of the Projects

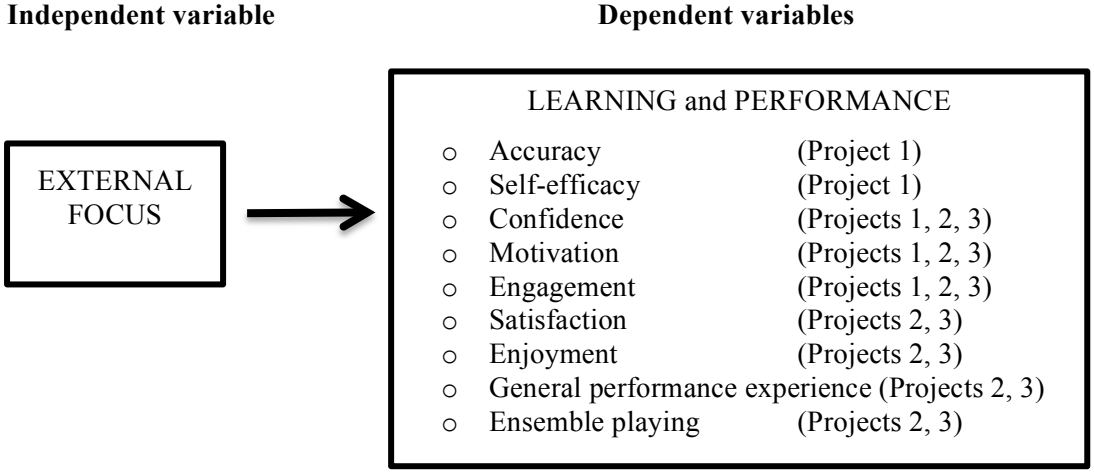
Introduction

The effects of external focus on musicians' learning and performance were explored in three consecutive empirical projects involving conservatoire students. The three projects took place between March 2015 and April 2016. In the first two projects the subjects were natural trumpet players (n=7) and the same people participated in both projects. Using natural trumpeters as test subjects was not only practical (the researcher is a natural trumpet player and teacher), but also expedient because measuring accuracy in natural trumpet playing is relatively straightforward. Even slight inaccuracies in motor control can be heard as clearly audible mistakes. Inaccuracies during playing can simply be counted. The third project involved a chamber music ensemble with mixed instrumentalists (natural trumpeters, string players and keyboard players).

The projects were designed in such a way that each consecutive project represented a more complex context: Project One tested a series of practice sessions where external focus was compared to the participants' "usual" ways of practicing, and Project Two explored the effects of external focus in the preparation of a trumpet consort performance. Project Three was the preparation of a concert involving not only trumpeters, but also string players and keyboard players in order to ascertain whether external focus could benefit musicians in general and not only trumpeters.

Each project was designed to investigate the effects of specific independent variables, and the design varied for each project. The projects looked at the effects of external focus on aspects of learning and performance experience of the participants and specifically involved looking at the effects on accuracy, self-efficacy, confidence, motivation, engagement, satisfaction, and enjoyment, as well as general performance experience. A mixed methods design was used in each project to gather both quantitative and qualitative data. The variables of all three projects are illustrated in Figure 4.1.

Figure 4.1 Variables for the Three Empirical Projects



Measuring **accuracy** gives a clear indication of whether a skill has improved.[27] Improved **self-efficacy**, **confidence** and **motivation** are indicators that the subject's ability to learn has been positively influenced (Bandura, 1997; Dweck, 2000; 2008; Wulf & Lewthwaite, 2016). **Engagement, satisfaction** and **enjoyment** levels are indicators of whether the learning or performing experience was a positive one for the participant. According to studies on anticipatory auditory imagery, **ensemble playing** can also be expected to be positively affected (Keller, 2012).

All three projects involved the players practicing and/or rehearsing using external focus. The context and design of each project differed and each project investigated specific independent variables. The assumption was that external focus would positively affect both skill acquisition (learning) and the performance experience of the participants.

The overall hypothesis was that using external focus would be beneficial to musicians' learning and performance experience.

APT: Designing an Audiation Practice Tool

Over the course of the three projects the participants were subjected to different forms of external focus (explained in more detail in the following section). The use of the Audiation Practice Tool (described below), however, featured in all three. Verbal-based instructions were avoided as much as was possible.

[27] Using external focus to focus on musical results rather than focussing on technical results (e.g. accuracy) does not mean that accuracy is not important in music-making. Accuracy is an indication of the level of motor control achieved. The hypothesis of the research described in this study implies that accuracy is achieved by not focussing directly on accuracy, but is rather a side effect of "musical" focus.

A practice tool was designed to test and explore external focus in all three empirical projects. The APT (Audiation Practice Tool) is based on Edwin Gordon's definition of audiation (see Chapter 3) and illustrated below in the way it was presented to the subjects.

> **APT: Audiation Practice Tool**
>
> Instructions:
>
> **Imagine** the phrase you are about to play with as much nuance as you can evoke (e.g. pitch, tone quality, volume, articulation, transition from one note to another…)
> **Sing and gesture** the phrase dramatically
> **Play** the phrase
> Play **another version(s)** of the phrase

The uses of clear and vivid musical imagery, singing, gesturing and playing variations were described in detail in Chapter 3. Alternate fingerings or changes in tonality – as suggested by Gordon (2001) – is not possible on a natural trumpet as it is restricted to the harmonic series of a specific key.

How External Focus was used in the Projects

The use of external focus was integrated in each project, sometimes in an overt way and sometimes covertly as well. In the intervention phase of Project One the participants were asked to practice using APT. The participants in Project Two were asked to prepare their repertoire using APT, and rehearsals were conducted with the intention of avoiding technical (declarative) language. The project and concert itself focussed on showing the role of the trumpet in baroque Europe rather than the (more usual) focus of showcasing the music. The performance incorporated narrative (by an actor/narrator) and audience interaction, and resulted in less focus on perfect playing than usual for a chamber music concert. Project Three was designed so that the participants were busy with the idea of communicating emotion and affect during performance (again, rather than concentrating on technical perfection). The idea for the concert preparation was to create a learning environment that encouraged exploration – through improvisation and the use of APT. As in Project Two, the use of declarative instruction was avoided.

5

Empirical Project One: The Effects of External Focus on the Skill Acquisition of Natural Trumpet Players

Introduction

Project One examined the effects of external focus on the learning of natural trumpet players – specifically the effects on accuracy (correctly placed notes), self-efficacy, confidence, motivation and engagement – the expectation being that all of these would be positively affected. The combination of the dependent variables would be an indication of objective and subjective learning success and experience.

The three research questions for Project One were: **[RQ 1]** *What are the effects of external focus of attention on the accuracy and self-efficacy of the participants?* **[RQ 2]** *What are the effects of external focus of attention on confidence, motivation and engagement of the participants?* **[RQ 3]** *What was the experience of using APT for the participants?* The hypothesis for Project One was that the participants would have higher ratings for accuracy and self-efficacy, as well as for confidence, motivation and engagement as a result of using the external focus practice tool (APT).

The form of external focus used in Project One was the Audiation Practice Tool: APT (see description in the previous section). As mentioned previously, natural trumpeters are appropriate as test subjects because accuracy can be relatively easily measured. A mixed methods design was used with the assumption that comparing two learning conditions using a combination of quantitative results (especially for measuring the main dependent variables: accuracy and self-efficacy) and qualitative results from questionnaires, logbooks and interviews, would give a rich representation of the effects of external focus on the participants. The project consisted of a "Control Phase" and an "Intervention Phase" – also referred to as "APT Phase". Participants gave verbal consent at the beginning of the project and later signed a release statement agreeing to the use of all data collected during the projects.

Method

Participants

The seven participants were all students of the researcher and were a diverse mixture of age (mean age 30.6 years, standard deviation 8.7 years, ranging from 24 to 45 years), gender (five male and two female), nationalities (Canadian, Singaporean, German, Dutch and Russian), years of experience playing the trumpet (ranging from 12 to 38 years) as well as experience on the natural trumpet (from 1.5 to 3.5 years). Years of study with the researcher ranged from

1.5 to 3.5, and the study levels ranged from first year minor through bachelor to second year masters. For further details, see Table 5.1.

Table 5.1 Participants in Project One

Participant	1	2	3	4	5	6	7
Age	28	26	24	24	45	41	26
Gender	M	M	F	M	M	M	F
Nationality	Can	Sing	D	NL	NL	RU	RU
Experience Trpt	16.5	20	12	14	38	29	14
Experience Nat	7.5	3.5	1.5	1.5	7	5	2
Study with SW	3.5	3.5	1.5	1.5	3.5	3.5	2
Study level	M2	B4	Min1	Min1	M1	M2	B2

Can=Canadian; Sing=Singaporean; D=German; NL=Dutch; RU=Russian
Trpt=trumpet; Nat=natural trumpet; SW=Susan Williams
M1=first year masters; M2=second year masters; B4=fourth year bachelor; B2=second year bachelor
Min1=first year minor; Min2=second year minor

Apparatus, Materials and Measures

Recordings

Recordings were made at the beginning and end of each practice phase with two devices. Audio recordings were made using MacBook and Recorder Pro software, and audio-video recordings using Sony digital HD video camera recorder. The sight-reading and sight-reading practice sessions were also recorded with both devices. More sophisticated recording quality was not needed for the purposes of this study, as artistic expertise was not being assessed.

Table 5.2 Sources and Descriptions of the Test Pieces (To view the scores, see Appendix A)

Group	Origin	Notes	Bars	Beats
Group A				
1a	C.P.E. Bach: No. 11 (Aria) from Auferstehung und Himmelfahrt Jesu	85	28	47
2a	J.S. Bach: No.8 (Aria) from BWV 20 "O Ewigkeit , du Donnerwort"	203	29	91
3a	J.S. Bach: No. 2 (Chorus) from BWV 31 "Der Himmel lacht"	100	9	33
4a	J.S. Bach: No. 7 (Choral) from BWV 19 "Es erhub sich ein Streit"	76	36	72
Total		**464**	**102**	**243**
Group B				
1b	C.P.E. Bach: No. 8 (Aria) from Einführungsmusik	143	29	53
2b	J.S. Bach: No. 7 (Aria) from BWV 43 "Gott fähret auf mit Jauchzen"	182	28	94
3b	J.S. Bach: No.1 (Chorus) from BWV 130 "Herr Gott, dich loben alle wir"	88	8	28
4b	J.S. Bach: No.9 (Choral) from BWV 31 "Der Himmel lacht"	59	15	44
Total		**472**	**80**	**219**

Test Pieces (repertoire)

The test pieces for Project One (four for the control phase and four similar pieces for the intervention phase) were excerpts from baroque trumpet literature chosen by the researcher (see Table 5.2). The chosen pieces were excerpts (some with slight adaptations by the researcher) from works by J.S. Bach and C.P.E. Bach, and representative not only of the difficulties that face natural trumpeters, but typical of the type of repertoire they are asked to play as professionals. Excerpts were chosen from relatively unfamiliar pieces to ensure that the subjects did not know them well. Each subject was asked before each phase if he/she was familiar with each test piece. Two groups each consisting of four pieces, were chosen so that each *group of pieces* taken as a whole matched in style, difficulty and length.

The intention was that Group A was, as a whole, of similar difficulty to Group B. Although the pairs of pieces: 1a and 1b, 2a and 2b etc., were similar, it is only as a group of four that they contain all the various difficulties and can be rated as similar to the other group of pieces. Music for the trumpet by J.S. Bach is very demanding (especially in the high and fast passages), and yet idiomatic for the instrument. C.P.E. Bach's trumpet parts are less idiomatic, as they often contain large and awkward intervals together with a large tessitura. To view the scores of individual test pieces, see Appendix A. In addition to the test pieces, a sight-reading piece was used to determine the skill level and usual practice style of the participant. A piece of repertoire was selected that was previously unknown to all of the

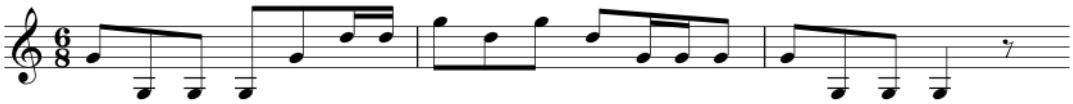
participants. The piece used for the sight-reading test for all seven participants was an excerpt from Leopold Mozart's Missa Solemnis in C (*Et resurrexit*), see Appendix A.

Criteria for the selection of the test pieces

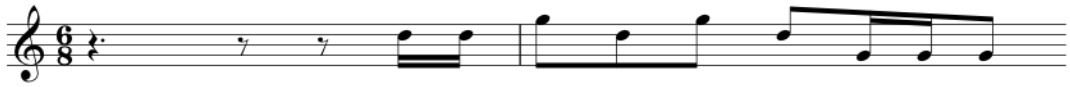
As the participants ranged from beginners on the natural trumpet to players with several years of experience there was a wide skill level difference between the players. Each group of four pieces needed to be both challenging for all of the players as well as containing all of the main technical difficulties and challenges for natural trumpet playing. These challenges included large and/or awkward intervals, high range, low range, endurance, fast passages, entrances after rests, entrances on d'' and combinations of the aforementioned challenges. Examples of each of these challenges from the test pieces are illustrated below.

Figure 5.1 Examples of Technical Challenges from the Test Pieces

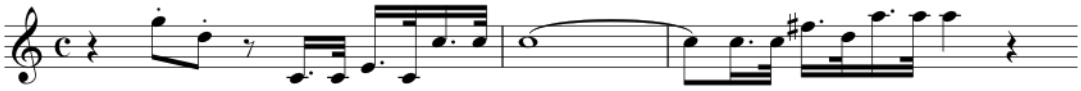
From 1b: large and awkward intervals and low range (♩ = 90)



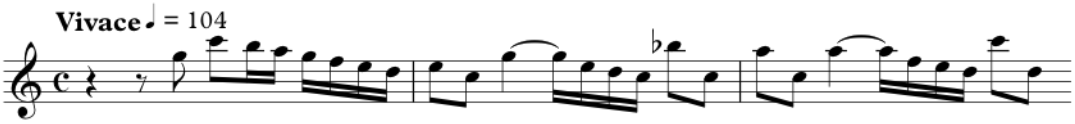
From 1b: awkward intervals, entrance on d'' after rests



From 2a: large and awkward intervals and fast passage (♩ = 50)



From 2b: large awkward intervals, high range and fast passage



From 4b: high range and endurance (♩ = 64)

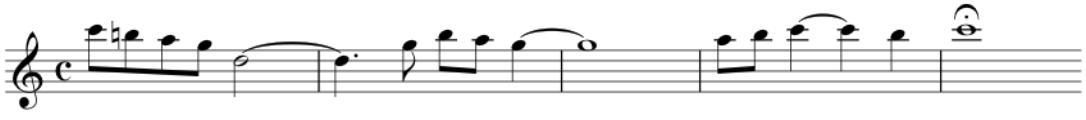


Figure 5.1 – excerpts from the test pieces that show examples of the difficulties within each of the pieces.

Questionnaires, Forms and Guidelines Used for Data Collection

Questionnaires, interviews, forms and guidelines designed by the researcher for collecting information and data from the project are listed and described below. The purpose for each is also outlined. For some of the questionnaires where ratings were required, a 10 cm visual analogue scale (VAS) was used, consisting of a line with a statement at each end where the participant indicates their answer with a mark on the line. This method is useful for measuring subjective characteristics.

A **general information questionnaire** was used at the beginning of the project, asking each participant their age, gender and nationality, as well as details about their trumpet playing experience and practice habits. The participants were also asked about what they find challenging about performing on the natural trumpet (to view the questions, see Appendix C). The purpose of the questionnaire was, in addition to profiling the participants, to establish their experience of natural trumpet playing, how much time they spent on it as well as their perception and awareness of the difficulties involved in playing and performing on the natural trumpet. Question 10: "What do you find – physically, mentally/cognitively, emotionally and organisationally challenging about performing on the natural trumpet?" checks whether the difficulties embedded into the design of the experiment correspond to the difficulties reported by the participants themselves.

A **pre-sight-reading/performance questionnaire** was filled out by each participant prior to playing the test pieces and the sight-reading piece, as well as prior to each performance. The questionnaire asked them to note how they felt – including embouchure strength, energy, motivation and confidence (see Appendix D). This particular questionnaire was included to check the participants' "current state", and whether there were any co-variants – extraneous reasons for the players' playing ability.

Each participant assessed in detail each of the four test pieces at the beginning of the control and intervention phases for how technically and musically challenging they were, using the **Repertoire assessment form** (see Appendix E). The purpose for this form was twofold. Firstly, answers to this questionnaire indicate to what extent the participants themselves had any difficulties with the test pieces in order to check if they had been well chosen for the experiment design. Secondly, the answers were compared with the responses to the same questions after the practice phase to see to what extent the perception of difficulty had changed.

In order to ascertain to what extent each participant already used external focus, a **practice style assessment form** (see Appendix F) was designed and implemented, asking what the participant was focussing on during a ten-minute practice session of the sight-reading piece. The results of this questionnaire were used to determine a "practice profile" for each participant. Different types of focus were randomly listed in the form. The answers could then

be tabulated into categories to ascertain a "practice profile", and see to what extent the participants already used external focus during practice. Table 5.3 lists the different types of focus from the form into categories.

Table 5.3 Types of Focus During Practice

I (internal focus) The body	**T (technical focus)**	**E (external focus)** The desired effect
My embouchure	The sound I am making	The musical phrase
My support	Rhythm	The sound I want to make
My breathing	Intonation	The meaning of the music
Relaxing my body	Hitting the right notes	Singing
The airstream	Avoiding the wrong note	
Tongue level	Certain notes	
Fingering	Tonality	
Tensing certain parts of the body	Musical structure	
Being relaxed	Trills	

Table 5.3 presents the types of focus that were presented in the assessment form (where they were presented in an order where the three types of focus were mixed). Participants were asked to first indicate whether they focussed on the aspect or not, and then to make a rating of the aspects that they focussed on, using a visual analogue scale (VAS).

In order to calculate how external focus affected the participants' self-efficacy, two self-efficacy scales (questionnaires) were used (see Appendix B): one for **self-efficacy for musical learning** and one for **self-efficacy for musical performance**. Both questionnaires were based on the validated self-efficacy scale devised by Ritchie & Williamon (2010). The original seven-point scale was changed to a nine-point scale in order to obtain a more nuanced result. The results from the measure of self-efficacy for musical learning were used to control for any differences in the participants' well-being between the two phases. The results from the measure of self-efficacy for musical performance would indicate if there is a difference in the participants' performance self-efficacy between the control phase and the APT phase.

Participants were given **logbook session sheets** (see Appendix G) – one for each practice session – so they could record how they felt before and after each session (embouchure condition, energy, motivation and confidence). At the end of the session they wrote in the log sheet how engaged they were, and any observations or comments relevant to their playing ability for that session. This questionnaire had several functions: to make sure that the participant did the sessions; to check in case there are is anything else that is affecting the players' results other than the experiment itself (co-variants); to see if the session is physically demanding (by comparing condition and energy levels before each session with those after each session); and to see how external focus affected motivation and confidence (dependent variables) by comparing them before and after each session.

In order to ensure that all participants followed the same protocol and had clear guidelines for practicing, at the beginning of the intervention phase the participants were shown how to use the APT tool and given a sheet with **guidelines and rules for using APT** (see Appendix H).

After performing at the end of the control and the intervention phases, the participants rated their own performance and once again rated the difficulty of each of the test pieces using a **post-performance questionnaire** (see Appendix J). After the intervention (APT) phase, the participants were also asked about their experience with using the Audiation Practice Tool (APT). This questionnaire checked to see if the participants' perception of difficulty had changed after the practice phase (which they recorded in the repertoire assessment form). The last questions were designed to gather qualitative data about how the participants experienced practicing with APT and how APT/external focus affected them.

Procedure

The current students of the researcher (at that time) were personally invited to take part in research involving "practice style" (they were not aware of the real inquiry of the research). All of them volunteered and gave verbal consent. At the beginning of the project, each participant submitted general information and reported their playing condition, after which they assessed the sight-reading piece for difficulty and then played it through. The playing of the sight-reading piece was recorded. The participant then practiced the sight-reading piece for 10 minutes. The initial sight-reading as well as the practice session was recorded. Immediately after the practice session the participant filled out the practice style questionnaire.

The four test pieces were then handed out and the participant assessed each one for difficulty. Four subjects played Group A in the control phase and Group B in the intervention phase, and three did the reverse (to account for any unexpected differences in difficulty through counterbalancing). The subjects were each asked afterwards which group they found more challenging (to check whether the selection was biased). The self-efficacy scale for musical learning was filled out, after which the participant played each of the four test pieces. The playing through of the test pieces was recorded. The log sheets were handed out and the guidelines and rules for practicing explained, in order to ensure that all participants followed the same protocol (see Appendix I for practice guidelines and rules).

For the next three days (control phase) the participants practiced three times a day for five minutes each session, at home. They were instructed to practice in their 'normal' way and to fill out the log sheet immediately after each session. The participants met with the researcher on days 1 and 5 for each phase.

On the day after the last practice day, each participant reported their playing condition, filled out the self-efficacy scale for musical performance and played through the four test pieces.

This performance was recorded. The participant rated their performance and the difficulty of each piece in the post-performance questionnaire.

The intervention phase where the participants practiced using APT took place eight weeks after the control phase. The order was not counterbalanced, as practicing with APT in the beginning might affect the control phase if it were to come afterward. The intervention phase differed from the control phase in that instead of practicing in their usual way, the participants were asked to practice using (only) APT. Each participant was given a demonstration by the researcher of how to practice by using APT. The post-performance questionnaire at the end of the APT phase included questions asking the participants to comment on their experience using the Audiation Practice Tool (APT). Table 5.4 shows the time flow of each of the two phases.

Table 5.4 Procedure of Control and Intervention Phases

	CONTROL PHASE	
DAY	**PROCEDURE**	**Recording**
Day 1	Each participant fills out general information questionnaire, pre-sight-reading questionnaire, piece assessment form.	
	Participant is shown sight-reading piece, fills out the repertoire assessment form and plays sight reading piece.	**X**
	Participant practices the sight-reading piece, then fills out practice style assessment form.	**X**
	Participant is presented with the four test pieces and assesses each (using the repertoire assessment form).	
	Participant fills out the self-efficacy form for musical learning.	
	Participant plays (sight-reads) through each of the four test pieces.	**X**
	Logbook session sheets are handed out and explained.	
Day 2	Participant practices in their usual way. 3 sessions (each 5 minutes) and fills out a log sheet for each.	
Day 3	Participant practices in their usual way. 3 sessions (each 5 minutes) and fills out a log sheet for each.	
Day 4	Participant practices in their usual way. 3 sessions (each 5 minutes) and fills out a log sheet for each.	
Day 5	Participant fills out pre-performance questionnaire.	
	Participant fills out the self-efficacy form for musical performance.	
	Participant performs each of the four test pieces.	**X**
	Participant fills out the post-performance questionnaire.	

	Intervention/APT PHASE (8 weeks later)	

DAY	PROCEDURE	Recording
Day 1	Each participant fills out pre-sight-reading questionnaire.	
	Participant is presented with the four test pieces and assesses each (using the repertoire assessment form).	
	Participant fills out the self-efficacy scale for musical learning.	
	Participant plays (sight-reads) through each of the four test pieces.	**X**
	Participant is given instructions on how to practice using APT.	**X**
	Session sheets are handed out and explained.	
Day 2	Participant practices, using APT. 3 sessions (each 5 minutes) and fills out a log sheet for each.	
Day 3	Participant practices, using APT. 3 sessions (each 5 minutes) and fills out a log sheet for each.	
Day 4	Participant practices, using APT. 3 sessions (each 5 minutes) and fills out a log sheet for each.	
Day 5	Participant fills out pre-performance questionnaire.	
	Participant fills out the self-efficacy scale for musical performance.	
	Participant performs each of the four test pieces.	**X**
	Participant fills out the post-performance questionnaire.	

Data Analysis

The main inquiry of Project One was to find out whether and how external focus affected accuracy and self-efficacy. In addition, the effects on confidence, motivation and engagement were evaluated, as well as the participants' experience of using a practice tool based on external focus. The effects of external focus were compared to the effects of the participants' "usual" way of practice. The first sub-hypothesis for Project One was that *external focus would have a positive effect on the participants' accuracy.*

a) Determining accuracy [RQ 1a]

Differences in accuracy based on the training were determined by comparing the changes in accuracy (correct note placement) after a phase where the players used their normal practice methods to a phase where they used external focus. The first step in this process was to count the number of miss-pitched notes. Figure 5.2 is an example of how each of the pieces was scored.

Figure 5.2 Example of Accuracy Scoring

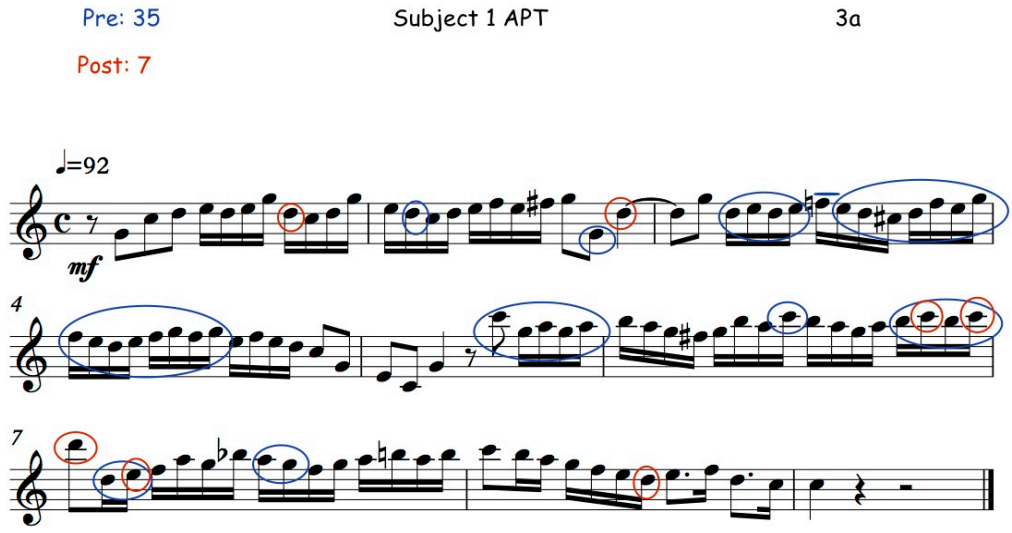


Figure 5.2 shows the accuracy scoring for participant 1 – piece 3a in the APT (intervention) phase. At the beginning of the APT phase, participant 1 played 35 miss-pitched notes. At the end of the three-day practice period there were seven miss-pitched notes resulting in an accuracy improvement of 28. After combining this score with the other three test pieces (and converting them to an ordinal scale – see below), the resulting score was compared to the score from the control phase.

Simply counting the number of mistakes does not give a true picture of accuracy, however. In order to rate each error accurately, the range of expertise within the group of participants needed to be taken into account. An improvement of just a few notes would be substantial for an expert player who made few initial mistakes, but would not have such a high value for a novice who made many mistakes in the first place. Another factor to consider was that during a very fast passage a player may stumble at the beginning and result in the whole passage going wrong. Such an inaccuracy should count for less on a scale of error, than the total of miss-pitched notes in the "blundered" section. In order to incorporate these factors, an ordinal scale was implemented where the number of mistakes had incrementally less value. Twenty errors or more for one test piece (the pieces were very short) was given the same value.

Table 5.5 shows how the metric scaled values were transformed into an ordinal scale.

Table 5.5 Metric Scaled Values for Accuracy Transformed to an Ordinal Scale

Metric scaled values (no. of miss-pitched notes)	Ordinal scaled values
0-1	1
2-3	2
4-5	3
6-10	4
11-15	5
16-20	6
> 20	7

After calculating the difference in the scaled accuracy between the control and APT phases (where the control score was subtracted from the APT score), the resulting score was denoted as the **EF score** (External Focus score).

The sub-hypothesis was tested by statistically comparing the differences between the accuracy improvement in the control and APT phases using a paired t-test, after checking the assumptions of a normal distribution. In case of a non-normal distribution, a non-parametric alternative (Wilcoxon signed-rank) test was used, with a threshold for statistical significance of $\alpha < 0.05$.

b) Determining Self-efficacy [RQ 1b]

The second sub-hypothesis for Project One was that *external focus would have a positive effect on the participants' self-efficacy.*

Self-efficacy for learning and for performance was measured by means of the validated self-efficacy scale developed by Ritchie & Williamon (2010). Learning and performance were each addressed in a separate questionnaire. The scale was adjusted from a seven-point scale to a nine-point scale in order to obtain a more nuanced result.

This sub-hypothesis was addressed by comparing the differences in self-efficacy scores between the control and APT phases using a paired t-test, after checking the assumptions of a normal distribution. In case of a non-normal distribution, a non-parametric alternative was used, with a threshold for statistical significance of $\alpha < 0.05$.

c) Determining Confidence, Motivation and Engagement [RQ 2]

The third sub-hypothesis was that *external focus would have a positive effect on the participants' confidence, motivation and engagement* compared to their usual way of practicing.

Participants provided self-report scores for confidence, motivation and engagement levels at the beginning and end of each practice session in a logbook, during both the control and the intervention phases. The scores were added together for each participant for each phase, and the resulting total was compared between the control phase and the APT phase. The sub-hypothesis was tested by comparing differences between the control and APT phases for each related measure using a paired t-test, after checking the assumptions of a normal distribution. In case of a non-normal distribution, a non-parametric alternative was used, with a threshold for statistical significance of $\alpha < 0.05$. The participants were also asked to provide any other explanations for an inability to play well (e.g. illness, tiredness, playing too much previously, mental problems).

d) Determining the Participants' Experience of Using APT [RQ 3]

The final sub-hypothesis for Project One was that *the participants would experience external focus by using APT*. In order to address this sub-hypothesis, a post-intervention questionnaire

included the questions: “What did you learn and notice about practicing APT?” and “How did you feel when practicing this way?” The answers were analysed using a global coding method (Frick, 2011) and identifying the themes that emerged (see Appendix L for the coding methods). Specific issues and themes connected with the research inquiry (e.g. evidence of positive or negative effects from using APT; evidence of experiencing external focus) were recognised and analysed.

Results

Participant Data and Design Findings

It was important at the outset of these empirical projects to ascertain both the skill level and the practice behaviour of each of the participants, as these may have been needed to interpret the results. The results of the sight-reading and practice session on day one revealed a large range of skill and sight-reading ability and a diverse range of practice profiles amongst the seven participants, as shown in Table 5.6.

Table 5.6 Skill Level of Participants

Participant	Study level	Errors	Skill assessment
1	2nd year Master	5	High skill level: facility, accuracy and high range good; expressive
2	4th year Bachelor	11	Medium skill level: facility and accuracy not always reliable; high range not strong
3	1st year Minor	42	Low skill level: facility and accuracy low; high range not strong
4	1st year Minor	33	Low skill level: facility and accuracy low; high range not strong
5	1st year Master	22	High skill level: facility, accuracy and high range good.
6	2nd year Master	21	High skill level: facility, accuracy and high range good
7	2nd year Bachelor	13	Medium skill level: facility and accuracy mostly good; high range weak

Table 5.6 gives an overview of the skill level of each participant, their study levels and an indication of their sight reading ability. “Errors” refer to the absolute number of wrong notes. The skill assessment was made by the researcher (also the participants’ teacher at the time of the experiments) and based on observation. Facility refers to flexibility with fast passages and large intervals.

The scores from the practice style questionnaire were calculated in order to see which type of focus each participant favoured (See Table 5.3 for examples of types of focus reported). The results are shown in Table 5.7.

Table 5.7 Practice Profile Results

Participant	Internal focus	Technical focus	External focus
1	**53**	26	17
2	8	**28**	0
3	21	**24**	10
4	16	**46**	0
5	9	**35**	8
6	28	**50**	24
7	23	**50**	10

Table 5.7 shows the total focus scores for each participant. The preferred focus for each participant is indicated with bold font.

The results show that all seven participants favoured a technical and internal focus over an external focus (see *Criteria for the selection of the test pieces* in Table 5.3 for the individual elements). There was very little external focus evident in the participants' practice style at the beginning of the project. It could be therefore assumed that a practice regime based on external focus would be new and not usual. Some of the participants were relatively new to the natural trumpet and others very experienced. Whether external focus can be beneficial to all skill levels – as claimed by Wulf (2013) – can be tentatively explored with this participant group, even though the group is relatively small. For detailed results on practice style, see Appendix K.

The participants were asked which group of test pieces they found more difficult – in order to test if the two groups were perceived to be equally challenging for each phase. Four of the participants found Group B harder (while for three of these four participants Group B was the intervention phase), one found Group A harder, and two found them equal in difficulty, so overall they did not consistently find one group of pieces to be more difficult than the other.

The assessment of the pieces made by the participants confirmed the researcher's intentions – i.e. that the participants also perceived the specific difficulties embedded in each piece. Answers to question one revealed that both researcher and participants agreed on what the general difficulties of playing the natural trumpet were (i.e. entrances, high range, endurance, awkward intervals, very low mixed with high passages and entrances on d'').

Participants' reports about whether there were any other explanations for an inability to play well (e.g. illness, tiredness, playing too much previously, mental problems) showed quite a few instances of extra physical or mental stress amongst the participants. The self-efficacy scores for musical learning indicated that this, however, did not seem to affect their self-efficacy. A Shapiro-Wilk test showed that the data relating to self-efficacy for learning were not normally distributed and a (non-parametric) Wilcoxon signed-rank test indicated no statistical difference for this measure between control (Mdn = 87) and APT (Mdn = 93) phases, $Z = -0.73$, $p = .465$.

Main Results

The following results are concerned with describing and comparing the differences between the participants' normal way of practicing (control phase) and when they used APT (intervention phase), its effect on their accuracy, their self-efficacy, as well as their confidence, motivation and engagement. All statistical results were checked for normality of distribution using the Shapiro-Wilk test and where distribution was not normal, a Wilcoxen signed-ranks test was used. All tests carried out were two-sided.

a) Accuracy

Statistical results for the comparison between the control and intervention phases revealed a positive result for improvement of accuracy using APT (i.e. external focus) compared to normal practice. As the data for this measure are non-normally distributed, a Wilcoxon signed-ranks test was used. The results indicated that the group's accuracy scores were better using external focus (*Mdn* = 1.5) than using their standard practice method (*Mdn* = 0.75), $Z = 2.214$, $p < .05$. Both inexperienced and experienced players were positively affected – except for participant 3, who appeared to play worse at the end of the control phase and showed no obvious improvement using APT, and participant 5 who showed no difference between control and APT. The accuracy scores displayed in Table 5.8 and Figure 5.3, below, show the External Focus Scores – the difference between the control phase and the intervention phase for each participant and the mean value for the group.

Table 5.8 External Focus Scores

Participant	Diff. Control	Diff. APT	EF Score* (Diff. between Control & APT)
1	1.25	1.5	**0.25**
2	0.75	2	**1.25**
3	-0.5	0	**0.5**
4	0.5	1.25	**0.75**
5	1.75	1.75	**0**
6	0.25	1.5	**1.25**
7	1	1.5	**0.5**
Median	**0.75**	**1.5**	

Table 5.8 shows the differences in accuracy between the beginning and end of each phase, and between the control phase and the APT (intervention) phase (ordinal values). The number of errors were counted and then transformed into an ordinal scale to account for the discrepancy between the value of an error for an advanced player and a less skilled player. *EF score = External Focus score.

Figure 5.3 Differences between Pre- and Post-practice Accuracy for Control and APT Phases

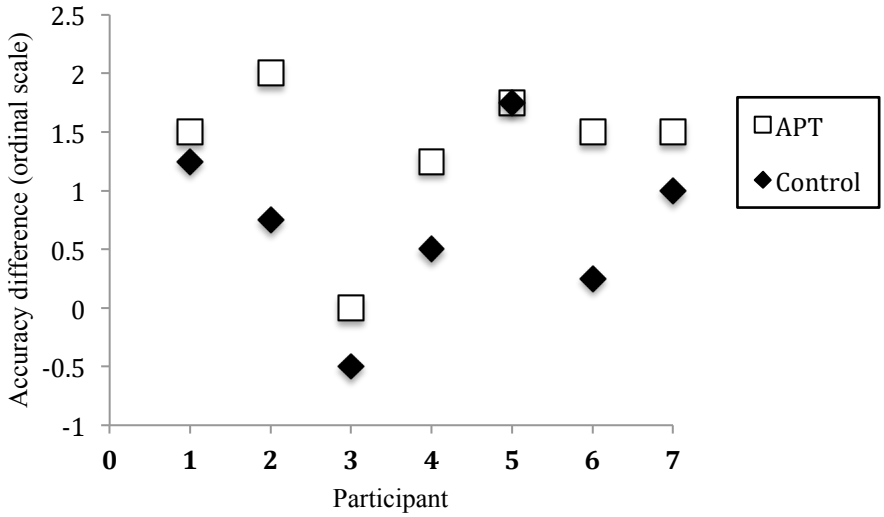


Figure 5.3 – the diamonds represent the improvement in accuracy (ordinal values) for the control phase for each of the seven participants (horizontal axis), and the squares represent the difference in accuracy for the APT phase.

b) Self-efficacy for performance

Self-efficacy for performance was measured using the validated self-efficacy scale developed by Ritchie and Williamon (2010). In some cases there were doubts about whether the (non-native English speaking) participants interpreted the questions correctly. For this reason, in addition to calculating the results of the whole questionnaire, the statistical results for just the first statement: 'I am confident that I can give a successful performance' were also calculated (with the same procedure described below). The difference between the score of the whole questionnaire and the first statement was not significant.

As the data on self-efficacy for performance were normally distributed, a T-Test was conducted. The results indicated no statistical support for a difference between the control (M = 58.43, SD = 17.377) and APT (M = 65.14, SD = 15.225), $t(1.754)$, p =.130. The direction of the difference in the results suggests however a trend that APT could be beneficial to higher self-efficacy in performance.

Figure 5.4 Self-efficacy for Performance

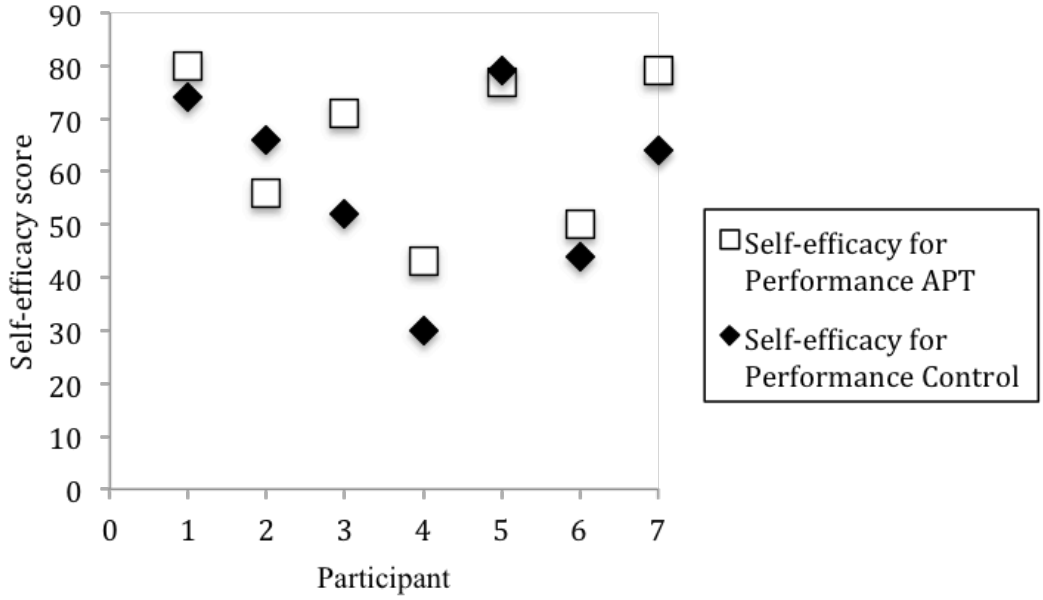


Figure 5.4 shows the scores for self-efficacy for musical performance for each participant. The highest possible score for this test is 99 and the lowest is 11.

c) Confidence, Motivation, Engagement

In addition to the main independent variables (accuracy and self-efficacy), confidence, motivation and engagement levels were also recorded. Paired t-tests gave no statistical indication that confidence was higher in the APT phase (M =0.302, SD = 0.523) than in the control phase (M = -0.259, SD = 0.664), t(1.619), p = .160. There was statistically no significant difference between the control phase (M = 0.067, SD = 0.418) and the APT phase (M = 0.201, SD = 0.702) effect on motivation, *t(.575), p* = .586. Paired samples t-tests for the participants' self-reports of engagement indicate no difference between the control phase (M = 5.389, SD = 2.128) and the APT phase (M = 7.284, SD = 1.569), t(2.064), p = .108. However, because of missing data in the engagement scores, these results are not as reliable.

Figures 5.5 and 5.7 suggest (despite the negative statistical results) a possible positive trend for confidence and for engagement, when considering the direction of the absolute differences.

Figure 5.5 Difference between Pre- and Post-confidence in the Control and APT Phases

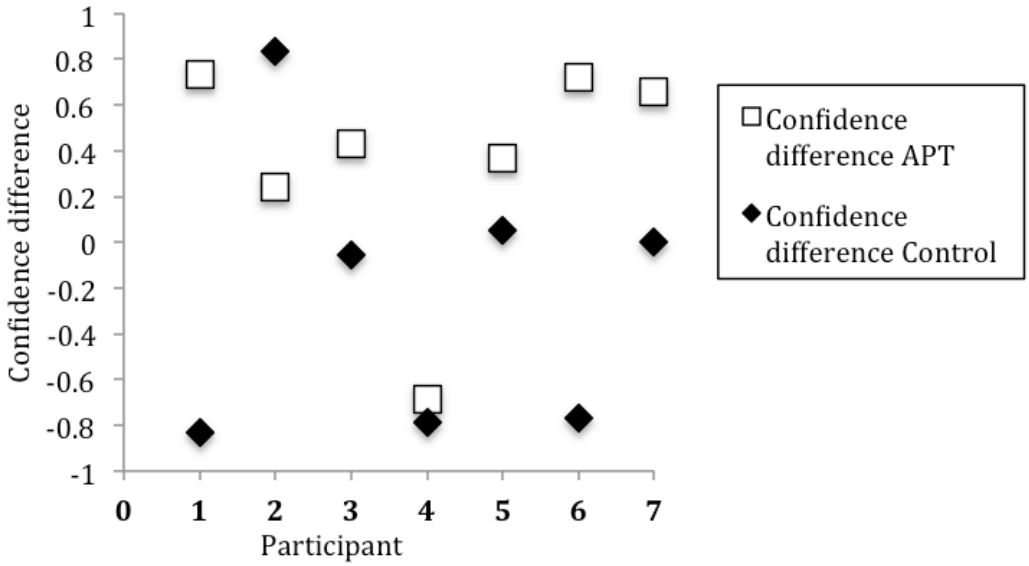


Figure 5.5 shows the difference in confidence for the control and APT phases according to how participants rated themselves before and after each of the nine practice sessions.

Figure 5.6 Difference between Pre- and Post-motivation in the Control and APT Phases

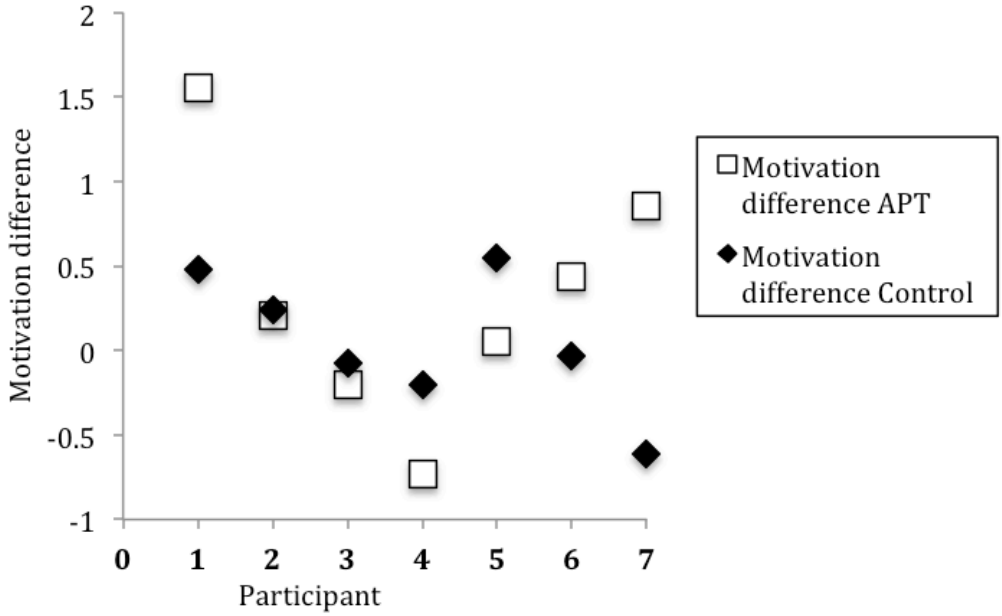


Figure 5.6 shows the difference in motivation for the control and APT phases according to how participants rated themselves before and after each of the nine practice sessions.

Figure 5.7 Difference between Pre- and Post-engagement Levels in Control and APT Phases

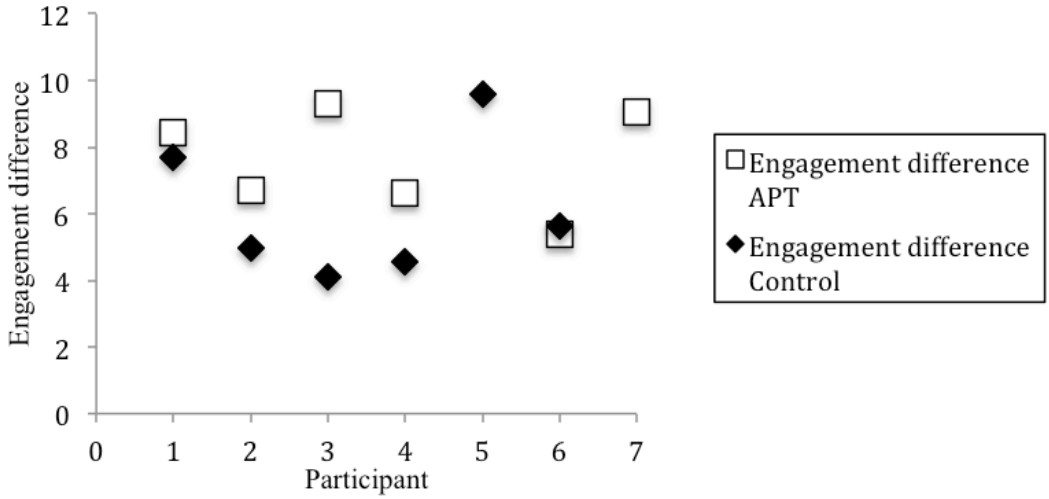


Figure 5.7 shows the difference in engagement for the control and APT phases according to how each participant rated themselves before and after each of the 9 practice sessions.

d) The Participants' Experience of Using APT

To address the question "What was the experience of using APT for each of the participants?" a post-performance questionnaire (see Appendix J) was filled out directly after Project One. Results of the qualitative analysis are summarised here (for full transcripts of the answers to this questionnaire, see Appendix L).

Several main themes emerged from the analysis. There was clear evidence that using APT promoted external focus. Six of the seven subjects described experiences of external focus with comments such as "I was actively thinking about the way I really wanted it to sound"; "APT encourages my sound imagination"; "[…] a great way to really get to know what you actually want"; "I get into expressing and audiating".

The participants' belief that APT leads to better learning was evident. Four of the participants mentioned that they thought APT helped them to learn: "[…] helps with learning the music"; "Faster result by playing less". Two participants expressed frustration when there was no immediate evidence of improvement: "it was uncomfortable that it did not help with developing endurance and mechanical securities"; "When it worked I was motivated, when not, I was unmotivated".

Using APT was reported as enjoyable, engaging and comfortable. Five of the participants said something about enjoyment and engagement or how easy it felt: "The practice sessions were never boring … how easy it was to focus"; "It felt easy for the brain; it was always active and everything I practice feels fresh even though I am physically tired … I enjoyed this practicing process overall"; "It was a lot of fun and never boring".

For some, gesturing was new and/or uncomfortable and not all believed gesturing was helpful: “I did not feel that dramatic gestures help much”. Some noticed that the method used less physical playing than usual, which was useful in avoiding too much physical strain to the embouchure muscles (this is true generally with mental training): “It also spares the lips”.

Discussion

General Discussion of Project One

Project One was designed to investigate the effects of external focus in learning and on the performance experience of a group of seven trumpet players. The expectation was that accuracy, self-efficacy, confidence, motivation, and engagement would be affected in a positive way.

Positive results were found for the effects of external focus on accuracy. The results for self-efficacy, although not statistically significant, do suggest a trend for performance self-efficacy improvement in the APT phase, compared to the control phase. Results for confidence also suggest a positive trend. Given the low sample size, further exploration of these trends is needed to establish this effect more fully. Scores for motivation and engagement from the participants’ logbooks were not conclusive (did not support the hypothesis) but the questionnaire answers revealed that APT encouraged most of them to audiate/experience external focus, and that it was engaging and enjoyable to use.

Accuracy for natural trumpet players – the production of a centred tone of the desired pitch – is an indication of fine motor skill acquisition. This is especially true for fast passages where the notes are in the high register, where the overtones are closer together and the differences in airstream minute. In addition, the high register is in itself more difficult to play than lower registers. This was evident in the less experienced players. The findings showed a positive result for accuracy overall. Only one of the participants (participant 5) showed no difference in improvement of accuracy when they used their own practice methods compared to using APT. Participant 3 got worse after the control phase and stayed the same after the APT phase, still yielding a positive difference. No one showed evidence that using the external focus tool was less effective than his or her regular practice methods. The slower pieces (piece 4 in both Groups A and B) showed the least improvement for all participants – suggesting that the more complex the piece, the more dramatic or obvious the effect of external focus during a short time period. Wulf (2012) mentions the importance of having challenging tasks when testing the effects of external focus. High range and endurance (the difficulties in pieces 4a and 4b) are skills that usually require more than three days to improve. Wulf’s claim that external focus can benefit both skilled and unskilled players is reflected in the results of this experiment. Participants 1, 5 and 6 were highly skilled; Participants 3 and 4 were beginners, and Participants 2 and 7 were relatively skilled.

It was noteworthy to discover that none of the participants favoured external focus in their regular practice – as was revealed in the practice profile results (considering the findings by Trusheim that brass experts relied heavily on external focus). All of the participants used internal focus – mainly focussing on steering their lip muscles (embouchure) and breathing mechanisms. This is typical of most brass players (both beginners and advanced players) as traditional teaching is highly focussed on how to direct and strengthen airflow. The technical focus used by the participants was mostly concerned with focussing on producing each note, correct intonation and correct rhythm. Presumably the players were accustomed to breaking down the music into separate elements during practice. This is also a usual way to practice for musicians where the individual elements are practiced or focussed on separately, and later combined when the musician is confident enough to focus on "music". The question of whether the experience of using external focus methods influenced the players' future practicing habits was asked and explored at the end of Project Two.

Limitations, Problems and Potential Biases for Project One

The fact that there were only seven participants allowed an in-depth controlled study but not the production of enough data to give more robust statistical results. All of the participants were students of the researcher and could have been biased to try to produce positive results – although this was hindered by the fact that they were not informed about the true subject of the research (they were told it was to look at the effectiveness of their practicing). In addition, the research was designed so that they were not aware of the fact that there was an intervention phase until after the control phase was over. One of the reasons there is so little empirical research on musicians is that measuring musical results is difficult, complex and contentious (Schmidt and Lee in Mornell, 2012). For this reason note-accuracy and the participants' own subjective experience were chosen as independent variables. It is not possible to know exactly how they practiced during the practice sessions, as the sessions themselves were not recorded. For future studies video recording each session would be recommended. Although there were only seven participants, the group was very inhomogeneous – containing large differences in playing level (although this could also be seen as an advantage).

New Questions and Future Research

The results of Project One strongly suggest that musicians' motor skill learning benefits from using external focus in terms of playing accuracy. Further studies using more participants and longer practice phases could give more strength to this claim. A similar design could be applied to other instruments, though there would be more problems in determining accuracy. Brass instruments – trumpet, trombone, horn and tuba – would be relatively easy. Clearer results for self-efficacy and confidence may also be gained with further studies using more participants. Experiments studying external focus for musicians could include other forms of

external focus – for example using metaphors, narrative or scenarios for practicing repertoire. Testing participants over a longer period of time may also bring added information as to the possible long-term benefits of using external focus.

6

Empirical Project Two: The Effects of Using External Focus in Preparing a Trumpet Ensemble Project

"Macht und Musik"[28]

Introduction

Project One was the first step in the research process exploring how external focus affects the learning and performance of musicians by investigating the effects of external focus on learning. The second step deals with using external focus to prepare and perform an ensemble performance using the same participants as in the first project. Therefore not only concert preparation and performance was addressed but also playing and working in a group.

The second project was an inquiry into the subjective *performance experience* of the participants as a result of using external focus to prepare for the concert as well as during performing. The first research question for Project Two was: **[RQ 4]** *How did preparing a project using external focus affect the participants' learning and performance experience?* The **dependent variables** for Project Two were motivation, confidence, ability to play accurately and musically, nervousness, enjoyment, engagement (with the music and/or the ensemble) and focus during performance and ensemble playing (see Figure 4.1). Measurements of all of the above variables were carried out using self-rating.

A second research question inquired whether the participants continued to use APT (which was introduced in Project One and also used in Project Two) after the experimental phase in which all seven trumpeters participated (i.e. at the end of Project Two): **[RQ 5]** *To what extent did the participants continue to use APT after Project Two?*

The hypothesis for Project Two (related to RQ 4) was that the experience of focussing externally during the preparation and performance would result in a positive learning and concert experience for the participants (i.e. more than usual for this type of concert project), with a lower than usual experience of nervousness. Positive learning and performance experiences are beneficial for general skill development and external focus can contribute to a reduction of self-focus and anxiety (see Wulf and Lewthwaite's OPTIMAL Theory, discussed in Chapter 1). Project Two was designed so that the performers/participants could have a high degree of task focus.

The artistic project was designed not only to explore the effects of using external focus during performance preparation and during performance, but also to bring concepts related to external focus into the approach and design of the artistic presentation itself. For instance, in

[28] Translation: "Power and Music".

the concept of the concert program the emphasis was not on the playing or the repertoire, but on what they represented. A detailed description of the artistic project and the external focus concepts embedded in it is presented in the next section.

Figure 6.1 Poster Advertising the Concert 'Macht und Musik'

Description of the Project

Macht und Musik (Power and Music) was a program featuring the natural trumpet – its music and its function in the baroque courts of Europe. Power in the royal and ecclesiastical courts was often reflected by the size, virtuosity and splendour of their musical ensembles, in particular the trumpet consort. Music was written for trumpets for ceremonial purposes and for festive occasions. The trumpeter during this period had a higher status than other instrumentalists and was controlled and protected by a very powerful guild.

The consort in this project consisted of the same seven natural trumpet players who participated in Project One, as well as the researcher herself, a trombonist, a timpanist and a lute (theorbo) player. There were many aspects of the preparation and performance in which the participants took part and were given autonomy (as recommended in the OPTIMAL theory): researching historical details, writing a script together with the actor/narrator, taking turns in coaching the rehearsals, and designing and carrying out a pedagogical element that involved interacting with children from the audience (e.g. demonstrating the natural trumpet and explaining the historical context). The idea behind the design of the project was that the participants (trumpeters) would be focussing on conveying meaning and communicating a "message" rather than on technical perfection and internal focus (controlling the body's movements during playing).

Figure 6.2 Excerpts from the Performance of 'Macht und Musik'

A short documentary about the project can be viewed here:
https://www.youtube.com/watch?v=mCuSsPFC-9s

Method

Participants

The participants consisted of eight trumpeters – the same seven trumpet players that participated in Project One (see Table 5.1 for participant demographics and details) plus the researcher herself, as well as a timpanist (masters student from the Royal Conservatoire The Hague), a trombonist, a lute player (fourth-year bachelor student from the University of the Arts, Bremen), and a (professional) narrator/actor from the bremer shakespeare company. Data were collected only from the trumpeters.

Apparatus, Materials and Measures

Recordings

Parts of the group rehearsals and the whole concert were video recorded by filmmaker Daniel Brüggen, using professional filming equipment (These recordings were made for documentation and not part of data collection). For the post-project interviews audio recordings were made using MacBook and Recorder Pro software.

Repertoire

The criteria for selecting the pieces for the concert included that the pieces represent the theme of the concert: consort music from different European baroque courts. In addition, it was important to include a combination of easy and challenging parts, to fit the differing

expertise levels within the group. In order that all the participants could feel engaged and not stressed or bored, careful consideration was needed in delegating the parts. A list of the pieces and (narrator) texts used for the project can be found in Appendix T.

Instructions

Practice Instructions and APT

In order to ensure the participants prepared their own part using APT, and to have a broader context and understanding of the music by playing the other parts, each participant was supplied with all of the parts for each piece in the program and asked to prepare their own part, as well as (at least) some of the other parts using APT. They were supplied with practice log sheets and a reminder of how to practice with APT (see Appendix H). APT was used both as an individual practice tool and also in the rehearsals (the amount of practice time was left up to the participant).

Measurements Used for Data Collection

Post-performance Survey

After the performance, the participants were sent an online survey via SurveyMonkey, which asked about their experience and assessment of the performance. The survey was conducted seven days after the performance and was anonymous, in order to ensure that the subjects would be less biased to give socially desirable answers. The first three questions addressed the dependent variables, and the participants were first asked to rate the concert performance against similar concerts played in the past year – to see if they found it worse, the same, better, or the best.

The second and third questions also asked them to compare their reactions directly before the performance, as well as their actual concert experience, with previous similar concerts (motivation and confidence). These questions addressed the other dependent variables (accuracy, nervousness whilst playing, ability to play musically, enjoyment, engagement with the music, engagement with the ensemble, and engagement with the audience). Asking the participants to make a comparison with previous similar performances was a subjective way to compensate for not having a control for the experimental manipulation (see Appendix O to view the survey questions).

Post-project Interview

Five weeks after the project, each participant underwent a semi-scripted interview, all of which were (audio) recorded. The interview had multiple purposes: to check the efficiency of the research design (i.e. if it worked), and also to gather more (qualitative) data in order to

answer RQ 4 (effects on participants' learning and performance) and RQ 5 concerning the participants' continued use of APT. A brief explanation of the eight questions follows.

The first interview question – *What do you find challenging about performing on the natural trumpet?* – was designed to check if the assumptions of the researcher about the difficulties of natural trumpet playing corresponded with the participants' own perceptions, as well as whether their own perceptions had changed since before the interventions (they were asked this question at the beginning of Project One).

The other questions asked the participants how they experienced Project Two, how they experienced using APT, and whether they still continued to use it. The last two questions were designed to see if the participants' learning and concert preparation strategies had changed as a result of the interventions, and what they had learned in general (the interview questions and the rational for each can be found in Appendix P).

Procedure

The seven trumpet players (participants) were sent the repertoire for the project and instructed to practice it for ten days (see practice instructions: Appendix M and practice log sheets: Appendix N). This was followed by a four-day rehearsal period together with the rest of the ensemble – the eighth trumpeter (the researcher herself), timpanist, trombonist, theorbo player and actor. The group was coached by the researcher, using techniques and methods based on external focus. The concert took place at Die Glocke in Bremen on May 10th 2015. Seven days after the concert the participants were asked to fill out a survey (anonymously)[29]. Five weeks after the project, each participant was interviewed.

Data Analysis

RQ 4 (*How did preparing a project using external focus affect the participants' learning and performance experience?)* concerned the performers' own ratings of motivation, confidence, accuracy and musicality, nervousness, engagement and focus. The data were collected via the post-performance survey, and combined with qualitative results from the post-project interview. The first three questions of the survey were designed so that the participants compared their experiences of the project with similar concerts they had performed in during the previous year – this was to compensate for the fact that there was no control condition for this project. RQ 5 (*To what extent did the participants continue to use APT after the experimental phase?*) was addressed by question 6 in the interview.

The interviews were recorded and transcribed, and the answers to each question were collated and analysed using a global coding method (Frick, 2011) that looked for emerging themes. The data were then examined to see to what extent they addressed both research questions for

[29] It would have been more ideal if the survey had been filled out immediately after the concert, when the participants' responses were fresh in their minds.

Project Two, as well as the main research question for this study. Due to the small sample size (seven), statistical analyses of the quantitative findings are not useful. The results are summarised in the next section (for details on the transcripts and coding methods see Appendix Q).

Results

Results Related to the Experiment Design

Questions 1, 3 and 4 from the post-project interview were related to checking aspects of the experiment design. Answers to question 1 revealed that the participants' own difficulties with mastering natural trumpet playing coincided largely with the researcher's original assumptions: difficulties include accuracy (especially for large intervals or fast passages), high range and endurance. Answers to question 3 indicated that the participants were not busy with comparing the feeling of natural trumpet playing with their modern trumpet playing, thus eliminating a possible confounding influence. Question 4 –*How often did you practice the concert material in the ten days preceding the concert and did you use APT?* – was a safeguard to check whether the participants really practiced as requested. One participant reported practicing the concert material several times a day, three practiced it every day, two practiced it less than once a day, and one prepared the material by only using mental practice (imagining). Five of the seven participants reported using APT to prepare the concert pieces. Of the other two participants, one used mental practice only and the other did not practice the repertoire at all prior to the rehearsals – both reported they were busy with other projects and their parts were not very demanding. For full transcripts of the interviews, see Appendix P.

Learning and Performance [RQ 4]

Results related to the dependent variables connected with RQ 4 are divided into two parts: a) learning experience; and b) performance experience.

a) Learning Experience

Results concerning what the participants learned from doing the projects were obtained from the analysis of questions 2, 5, 7, and 8 of the post-project interview (all seven participants were interviewed). They are described below and illustrated in Tables 6.1-6.4.

Several main themes emerged from the analysis:

1. Most of the participants were aware of using external focus in some way, and some reported that it affected their ability to be clearer about their musical intention: e.g. "I really know whilst I'm playing, what it stands for".
2. Players' experience included a feeling of more control, better concentration, enjoyment and more awareness of the musical context.

3. Players expressed their beliefs about what they thought was important or effective about some of the practice elements (see examples in the third category in Table 6.1).
4. Six of the seven participants showed evidence of developing new strategies for practicing and/or showed intention to use, or develop their use of, an external focus approach in the future: e.g. "this audiation method really worked for me – this dancing and this singing and this playing around with the music so really – do this even more extreme in my practice room and also play for and in front of people and to apply this also to the stage".

Table 6.1 Themes Arising from Question 2 –
"What did you notice in your recent performances (Macht und Musik and performances since then) and how would you prepare for the next ones?"

Q 2: THEMES	Total Participants (maximum = 6)
External focus	
Used APT	4
External focus/audiation/moving the listener	2
More clarity about what one wants (goals)	2
Knowing better what the music stands for	1
Importance of being part of a whole	1
Experience of/effect on the player	
More intention and concentration/engagement	4
Belief in effectiveness/improved ease and control	3
Enjoyment	2
More awareness of the other parts/players/score	2
Improved musicality	1
Importance of practice elements	
Explorative practice	3
Belief that variations are effective	2
Anticipation is important & effective	2
Studying the other parts is useful	1
Exaggeration is important	1
Strategies & approach	
Developing more strategies for practicing/importance of being out of the comfort zone/doing things differently	5
Intention to use and improve the approach in the future	4

Themes that emerged from the answers to question 5 include:

1. General learning experience. All but one of the participants reported that they learned something – especially about concert preparation and ensemble playing.

2. A few (three) participants mentioned specific elements that helped (see examples in the second category in Table 6.2).
3. Four participants reported how it felt and their engagement (e.g. “I felt more aware of the whole thing”; “I felt so comfortable … and confident”).
4. Six of the seven participants made positive assessments of the project: e.g. “The amazing range of possibilities you have for playing a specific phrase that you not just use the first idea that comes in your head, but explore the others and maybe see what’s best. And also – really how to prepare for a concert … for a higher quality than I’m used to”.

Table 6.2 Themes that Emerged from Question 5 –
“What did you learn from this project (Macht und Musik)?”

Q5: THEMES	Total participants
Learning experience	
Learned a lot/positive	4
Different than normal	4
How to improve ensemble playing	4
How to prepare a concert	4
More musical ideas	2
Learned nothing	1
Noticed specific things that help	
Sense of more possibilities because of explorative practice	2
Playing the other parts helped	2
Using external focus tools was effective	1
Playing only fragments helps	1
Gesturing and variations help	1
How it felt	
Deeper & more intensive than usual	2
Total engagement	1
Felt more comfortable and confident: more self-efficacy	1
Assessment of the result	
Effectiveness	5
Better ensemble playing	4
Efficiency	2
Played better than usual	2
Musical/more sense of what the music is about	2

Most of the participants reported that their former methods of practice were focussed on repetition. There was some evidence of use of external focus – mostly inner hearing and

singing. Several (three) participants noted that they did not trust their (old) way of practicing (see Table 6.3).

Table 6.3 Themes that Emerged from Question 7 –
"Before you did these two projects, what was your usual strategy for learning a new piece and how did you prepare concerts?"

Q7: THEMES	Total participants
Practice methods/strategies	
Repetition/playing through	6
Playing slowly	2
Varied practice	2
Perfecting each note and transition	1
Random practice for difficult intervals	1
Train endurance	1
Focus on balance and rest	1
External focus methods/strategies	
Singing	3
Inner hearing/mental practice	2
Gesturing	1
Listen to recordings of others	1
Focus on music	1
Imagine a story	1
Assessment of own methods	
Not efficient/effective	3
Hope/trust the practice worked	1

The impact of Projects One and Two on the participants was addressed in question 8. The responses are displayed here in two categories:

1. All of the participants reported a positive change resulting from their experiences in the project – for instance, in learning: "Yeah, I use it (APT) more than before, and I knew that it helped, but I found out that I have to do it more because I really feel that it helps me more. In a shorter time, you get more results"; motor control: "I practiced it in one session and then the next day – it was still there"; ability to focus more on the music and confidence.
2. Insights from some of the participants showed additional evidence of an enhanced awareness of the learning process and how it affects them: e.g. "I think it's become more 'more dimensional'. Definitely. And I also recognise that at a certain point it's more important – for me at least – the gesture or the content of the music is more important than just playing the passage".

Table 6.4 Themes that Emerged from Question 8 –
"What has changed since we did these interventions? Have they brought any new perspectives on learning or performing or on performance preparation?"

Q8: THEMES	Total participants
1. Changes & Improvements	
Positive change	7
I am learning better	4
Motor movements feel more secure: Strong retention: the body 'knows it'/'muscle memory'	4
Quicker result	3
Focus more on the music	3
Better result	2
Practice is more exploratory	2
Gesturing helps to communicate	2
Playing is easier, more comfortable, secure	2
More confidence	2
Less concerned with minor errors. Able to stay in the music	1
Less distraction	1
More use of APT	1
More exaggeration	1
2. Insights	
More enjoyable	2
Deeper experience during playing	2
More connection to the audience	2
More awareness/focus on the process	1
Gesture and musical content has become more important than the notes and physical (internal) focus	1

All of the participants reported experiencing a positive change in their approach to music-making, and many reported new insights into learning and practice as well as motivation to develop their strategies. There was evidence of more awareness in general – of what works and what doesn't work, of how it feels to play (physical and/or emotional), and of connectivity (to the music, the ensemble and the audience). The results confirm the hypothesis that the participants would experience a more positive learning experience than usual (compared to similar ensemble projects in the past year).

b) Performance Experience

All seven participants responded to the post-performance survey (anonymously). The results from the survey are described below and illustrated in Figures 6.3 – 6.6 and in Table 6.5.

Motivation and confidence

The participants' pre-performance feeling of motivation and confidence was reported as either average or higher than in comparable concerts in the past year. Both (and in particular confidence) scored highly (see Figure 6.3).

Figure 6.3 Motivation and Confidence (results from the online survey)

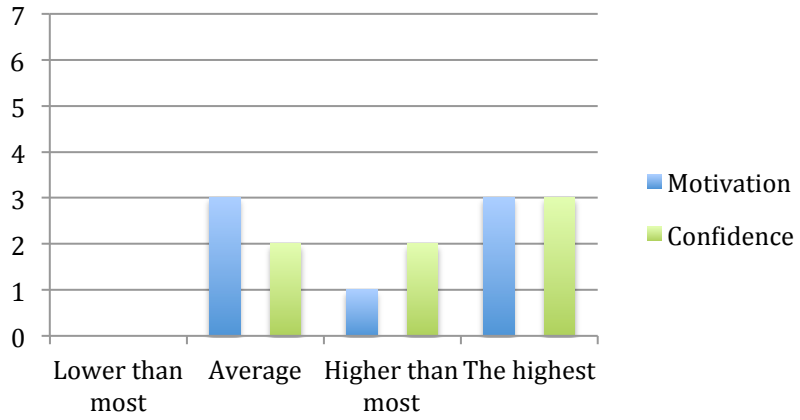


Figure 6.3 shows the seven participants' pre-performance motivation and confidence - two of the dependent variables for Project Two.

Overall Performance Experience

Figure 6.4 suggests that the participants' perception of their own technical and musical ability varied and that they had mostly positive and enjoyable experiences[30]. High engagement suggests that they were generally focussed on the task. Six participants reported that they were less nervous than usual.

[30] The player, who recorded accuracy as less than usual, volunteered the information that they attributed a decline in performance due to health reasons.

Figure 6.4 Performance Experience (results from the online survey)

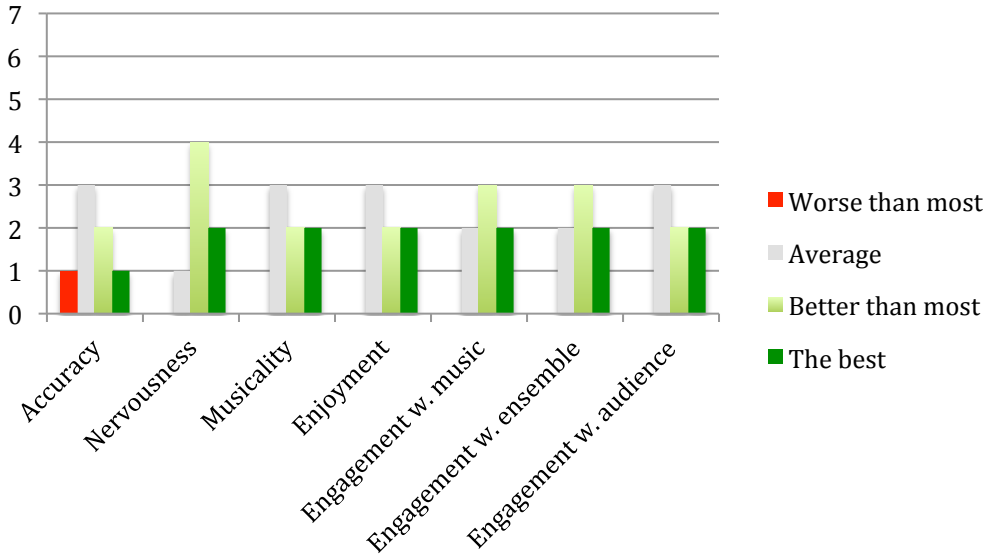


Figure 6.4 shows the seven participants' performance experience compared to similar concerts they played over the last year. The horizontal axis consists of dependent variables connected to RQ 4.

Focus

Figure 6.5 shows that the participants engaged in technical, internal and external focus during the concert. There was a marked decrease in focus on avoiding mistakes and thinking about what others think of them (self focus).

Figure 6.5 Focus During the Performance (results from the online survey)

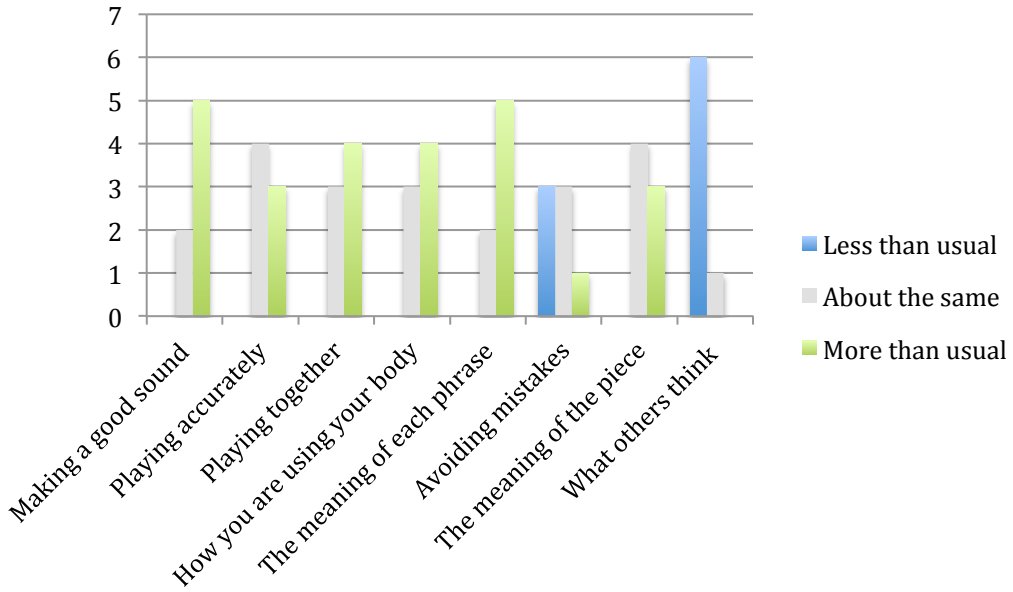


Figure 6.5 shows how the seven participants' focussed during the concert compared to their focus during similar concerts they played over the past year.

Overall Rating

The participants' overall rating of the concert is shown in Figure 6.6.

Figure 6.6 Concert Rating (results from the online survey)

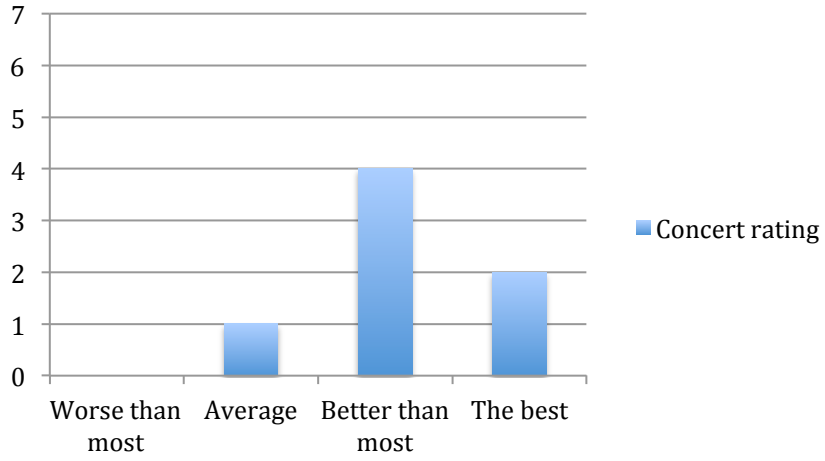


Figure 6.3 shows how the participants rated the concert in comparison with similar concerts that they played in over the last year.

Project Two had a positive effect on the performance of all of the participants, but in different ways and to different degrees. In particular there was higher engagement with the music, the ensemble and the audience than usual, and lower levels of nervousness. The results support the hypothesis for Project Two: namely that external focus during preparation and performance would have a positive benefit for the participants' learning and performance.

Results Related to the Use of APT [RQ 5]

Research question 5: *To what extent did the participants continue to use APT after the experimental phase?* was addressed by interview question 6. Answers revealed that most of the participants continued to use elements of the tool in every practice session. Only one reported not using the entire (whole) tool. The details can be seen in Table 6.5.

Table 6.5 The Participants' Use of APT – 5 Weeks After Project Two

	Never	Occasionally	Every day	Every session
Whole tool	1	3	1	2
Imagining	0	1	2	4
Singing	0	2	0	5
Gesturing	0	3	1	3
Variations	0	3	1	3

Table 6.5 and the answers to question 2 (*What did you notice in your recent performances and how would you prepare for the next ones?*) indicate that using APT had a strong impact on the participants, and that they all continued to use it to some extent.

Discussion

How can an approach based on external focus for preparing an artistic project affect the outcome and the musicians themselves? Would the impact last – would they continue to use and develop their external focus practice? The effect of Project Two – a project using external focus on learning and performance experience of the participants – is summarised below.

Effects on Learning

The response from the participants indicated that they experienced a variety of learning benefits affecting motor control, confidence and self-efficacy as well as a deeper musical experience. Both inexperienced and experienced players benefitted.[31] Benefits to learning and the approach to learning appear to have lasted also over time.

It was revealing that the participants' practice methods before the project were restricted mostly to repetition and that several had little confidence in their own way of practicing. This seems to have changed during and after the project. There was evidence of more awareness, more reflection, more self-regulation and more motivation in the participants' approach to practice. APT was a convincing tool for all participants as most continued to use it after the project.

Most participants reported that after the projects they developed the way they practiced and continued to consciously use external focus (RQ 5).

Effects on Performance Experience

Results from the survey and interview show mostly positive or neutral effects on the participants' performance experience. In particular the experience of confidence, connection with the ensemble and less self-focus (less nervousness) and more task focus was evident.

In conclusion, all of the dependent variables for Project Two – motivation, confidence, ability, nervousness, enjoyment, engagement and focus during performance – were to some extent positively affected according to participants' self-report. It was significant that the participants suffered less than usual from performance anxiety – this is coupled with their reports of less self-focus and less focus on not making mistakes. Another significant outcome was that there was more connectivity reported – between the participants and the music, the rest of the ensemble and the audience. None of the results suggests that any of the participants were negatively affected.

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[31] The one participant who reported the least benefit (participant 2) used only some mental practice before the rehearsal period – reporting that it was already familiar and not challenging.

Limitations, Problems and Potential Biases for Project Two

The participants were all students of the researcher, who no doubt wanted to give positive feedback. In spite of this the answers they gave in the survey (which was anonymous) and in the interview appear to be candid and honest. The lack of a control condition was in part compensated for in the design of the survey, asking participants to compare their experiences with their 'usual' concert preparation and performance experiences. As it was not possible to assess actual accuracy in the group context of Project Two, the emphasis was on subjective experience.

The outcomes of Project Two suggest that basing practice, performance preparation and focus during performance on external focus can have positive results on the musicians and on the performance. The next steps in a further exploration into the effects of external focus on musicians is to involve a mixed ensemble – i.e. not only trumpeters – and also to develop further design elements for a project to create an immersive learning environment based on external focus.

7

Empirical Project Three: Using External Focus in a Mixed Ensemble Project

"Biber Immersion Project"

Introduction

Project One examined the effects of external focus on trumpeters' skill acquisition, and Project Two extended the investigation to the performance experience of the same seven participants. Using external focus in an artistic context was taken one step further in Project Three, where instead of only trumpeters (with timpani and basso continuo players), a mixed ensemble including string players, trumpeters and keyboard players prepared and performed together using the previously described Audiation Practice Tool (APT) as well as a performance preparation approach based on the concept of external focus.

The researcher (who acted also as coach for the project) and a guest coach – violinist Rachael Beesley – coached the ensemble using an approach based on external focus. The overriding concept for the project was that music is a language and not a technical exercise. The main components/characteristics of the coaching approach were: using APT, avoiding technical language (e.g. referring to tempo, rhythm, intonation, articulation, pointing out wrong notes), using metaphors, addressing what the music or phrase is "saying": i.e. focussing on expression and communication.

The project was called "Biber Immersion Project" as the intention was that the participants would be immersed on many levels in music-making. In addition to rehearsing the repertoire (sonatas by H.I.F. Biber), the project consisted of extra components designed to enhance the idea of external focus. Added elements that made Project Three different from the previous project were: movement sessions, improvisation sessions, and lectures that provided the participants with information on the topics of "music as a language" and baroque rhetoric and "affect". A rationale for each of these elements follows.

Rationale for Each of the Added Elements

One major difference between this project and the previous two is that external focus was explained to the participants (in the opening lecture) in the context of playing baroque music in a rhetorical way. In order to help the participants feel at home in their body, movement sessions were included in the project. Each day a movement specialist led the participants for an hour of body awareness and movement exercises. The expectation was that this could help the participants to feel comfortable with using their body to express themselves through gesturing.

Improvisation sessions were introduced in order to help the participants feel freer in their ability to express themselves and explore the music. A lecture on rhetoric was presented in order to provide some insight into how to approach performing the repertoire (and baroque music in general) by focussing on emotions and 'affect' (i.e. distal external focus). The lecturer used iconographical allegories from the Renaissance and Baroque eras to illustrate how "affect" and emotion were explained in a non-verbal way.

The research questions for Project Three were the same as to those for Project Two except that they referred to an ensemble of mixed instruments rather than only trumpeters. The additional research questions for Project Three were: **[RQ 6]** *How did preparing a project using external focus affect the participants' (mixed ensemble) learning and performance experience?* **[RQ 7]** *Can previously found effects of APT on trumpet players be replicated in a more diverse group of musicians?* The hypothesis was that Project Three would result in higher than usual levels of engagement with the music and with the ensemble for the participants and that they would be inspired to use and develop an external focus approach in some way in their future practice.

Method

Participants

The 17 participants (11 females, 6 males) were all students of the early music department of the Royal Conservatoire, The Hague, and consisted of five trumpeters (three of whom participated in projects one and two, one additional player as well as the researcher herself), five violin players (plus coach Rachael Beesley), four viola da gamba players, a violone player, a lute player, an organist and a harpsichord player.

Apparatus, Materials and Measures

Variables for Project Three

Project Three had a similar aim to Project Two – to find out how basing the preparation of an artistic project for musicians affected the participants. The dependent variables were the same as Project Two: motivation, confidence, ability to play accurately and musically, nervousness, enjoyment, engagement, and focus during performance (see Figure 4.1).

Questionnaire

A questionnaire was handed out after the concert and all participants were invited to fill it out and send it back to the researcher. The questionnaire (see Appendix R) consisted of questions about how they experienced the project and what they learned. The first three questions were open questions in order to see whether the participants responded to the elements of the project connected to external focus without being prompted. The participants were free to give honest impressions of their experience. The questions included: *What was*

striking/touching/memorable about this project? What did I notice, and how was this project different from other KC[32] projects? What did I learn & what will I take with me after the project? After the concert: How did I experience this concert and how did this experience differ from other chamber music concerts I have played in recently?

Question 4: *Do you have suggestions that may help a project like this to work more effectively? Please write them here* – was a check on the design of the project.

Recordings

Parts of the group rehearsals and the whole concert were video recorded by filmmaker Daniel Brüggen, using professional filming equipment (as in Project Two, these recordings were made for documentation purposes rather than answering the current research question).

APT

The Audiation Practice Tool (previously described in Chapter 4, and see Appendix H) was used in the rehearsals.

Repertoire

The program consisted of nine sonatas from *Sonatae tam aris quam aulis servientes* by Heinrich Ignaz Franz Biber, and six duets by the same composer. Music by Biber was chosen because it is both attractive and challenging for all members of the ensemble. Biber's writing for violin is often virtuosic and his trumpet parts are considered by many to be more musical and lyrical than most literature for baroque trumpet. See Appendix U for the complete program.

Lecture "Music as a Language"

The researcher opened the project with a lecture that explained that rather than approaching music in a technical way, we as musicians could benefit from approaching it as a language. Focus and exploration of the repertoire could be on what the music is portraying – the emotions embedded within it; that music is a form of rhetoric and that the role of the musician is to move the listener. Participants were told that during the project we would avoid technical language and internal focus and rather find ways to learn, rehearse and perform by using external focus; that the emphasis would be on the *what* (the intended effect) rather than on the *how* (internal focus and technical and analytical thinking). The structure for the week was also explained at the end of the lecture.

[32] Koninklijk Conservatorium (Royal Conservatoire)

Movement Sessions

The movement sessions included grounding, movement and bodywork exercises developed by the teacher Fajo Jansen.

Improvisation Sessions

Improvisation exercises were designed by harpsichord student Valentina Villaseñor, and involved both melodic and harmonic aspects of improvisation loosely connected with performance of baroque music.

Lecture on Rhetoric

A lecture about baroque rhetoric and the "affects" examined the conveying of affect in musical performance, and was illustrated using examples from iconographical collections of allegories, vices, virtues, passions and affects by Cesare Ripa (1603).

Procedure

Figure 7.1 Advertising for the Biber Immersion Project

The musicians were recruited by advertising at the Royal Conservatoire, The Hague (see Figure 7.1). They were asked to be available for the entire week, for an 'Immersion Project' and to attend all sessions. The project began on Sunday 3rd April and ended with a concert on

Thursday 7th April 2016, and included lectures, rehearsals, movement sessions and improvisation sessions.

Day one began with the lecture "Music as a Language" by the researcher and followed with (ensemble) rehearsals, a movement session and another rehearsal. Day two contained rehearsals and a movement session as well as a lecture on rhetoric and an improvisation session. Days three and four contained rehearsals, improvisation sessions and movement sessions. The final day consisted of a general rehearsal, a movement session and the concert (see Appendix V for the full schedule). After the concert, each participant was handed the questionnaire and asked to fill it out during the next days.

Data Analysis

Data were gathered from the questionnaire, and the answers to the first three questions were analysed in the same way as the qualitative material from the other two projects – by using a global coding method and identifying the themes that emerged (for full transcripts of the answers, see Appendix S). Answers to question 4 (regarding suggestions for improving the project) were used as a check if there were any weaknesses in the design of the project.

Results

Eight of the 17 participants filled out the post-project questionnaire[33]. The results of the questionnaire are displayed in Table 7.1 (to view the questionnaire, see Appendix R, for full transcripts see Appendix S).

[33] As the questionnaire was anonymous, it is not known which of the participants answered it.

Table 7.1 Themes that Emerged from the Post-project Questionnaire for Project Three

THEMES	**Total participants** (Maximum respondents: 8)
1. External focus	
Evidence of external focus/audiation/moving the listener	6
More clarity/awareness of the musical goals & meaning	4
2. Experience of/effect on the player	
Positive experience/enjoyment	8
Holistic/body mind connection/in the moment/in flow	6
More connection (music/ensemble/audience)	6
3. Effective practice/rehearsal methods	
APT/gesture	4
Movement	5
Improvisation	2
Information on "affects"	3
Better ensemble playing	3
Coaching method	6
4. Insights & change	
New understanding	6
Ideas for new strategies/approaches	4
Intention to use and develop the external focus approach in the future	3

The themes that emerged from the post-project questionnaire were grouped into four categories:

1. All but one of the (eight) respondents mentioned experiencing some form of external focus, and for some, external focus was the main issue: e.g. "The difference with other concerts is that, for the first time, I was focussed on connecting with people, ensemble and audience, rather than creating something or thinking about technical things. I really felt music as a communication tool, as a language".
2. The project was a positive experience for all who answered the questionnaire – the key word being "connection" – with the other musicians, with the music and with the audience. Many players reported a "flow experience" of total engagement during the concert.
3. Most of the respondents mentioned the effectiveness of the way the project was coached. Specific elements that struck the players as being important were the movement sessions and the use of APT (in particular gesture and singing).

4. The project inspired new understanding as well as ideas for how to approach practice and performance preparation.

The answers to question 4 (suggestions for improving the project) included that the project could be extended, and some comments about improving scheduling. Paradoxically, the participant who only came to the rehearsal sessions suggested to the coaches that the other sessions and practicing with APT need not be compulsory, whereas two of the participants who did all of the sessions, found it disturbing that not everyone was fully committed to the whole experience. The invitation to join the project stipulated that everyone had to attend every session, but this did not happen, because of busy schedules and some reluctance from one or two of the participants (see above comment). Approximately two thirds of the group attended the movement sessions, and one half attended the improvisation sessions. All participants were present for the rehearsals and for the two lectures.

Discussion

The third and final project of this study was an opportunity to expose all types of instrumentalists (string players, keyboard players, as well as brass players) to an approach to learning repertoire and performance using external focus.

Effects on Learning

Ten sonatas constituted a lot of repertoire to be prepared in this short time, and yet by the concert the musicians felt that they could focus on musicality and communication. Some noticed the absence of a technical approach but no one reported missing it. Most of the respondents indicated that they gained new knowledge or insights on learning, which they would take away with them.

Effects on Performance Experience

The project was designed to focus on musical intention during the rehearsals and also during the performance. Six of the eight respondents referred to a "flow" state: e.g. "I felt very present in each moment in this concert, and it did also seem to go by very quickly". Anecdotally, it appeared that the response from the audience was very enthusiastic, and the attendance and atmosphere at the post-concert drinks at a nearby bar confirmed that there was overwhelming enthusiasm from the players. Everyone was there (this is unusual for school projects) and even the players who had been most sceptical during the project stated that it was one of their best performances (observation by the violin coach after speaking to the players after the performance).

Limitations, Problems and Potential Biases for Project Three

All participants were asked to attend all of the sessions, as it was important that the project was an experience of immersion. Due to students' busy schedules and/or reluctance to be out

of their comfort zone, some did not attend every movement or improvisation session (one third was not present at the movement sessions on days two and three, and one half did not attend the improvisation sessions). The project would have benefitted from being outside of the participants' daily life and schedule, to provide a more immersive quality.

Only around half of the participants (eight out of 17) filled out and handed in the questionnaire. This means that the feedback from participants is not complete. This is unfortunate, as a full response would have given a more balanced picture. Another limitation was the lack of a control condition.

Broader Relevance of the Findings

It was noteworthy that the participants had a positive response to the project, and also that they found it very different to what they normally experienced at the conservatoire. There were several positive aspects that stood out for participants, including the use of external focus, movement sessions and improvisation sessions. In addition, the fact that the two coaches played and performed together with the students and that there was no conductor seemed to enhance the experience – providing modelling (from the coaches) but also encouraging autonomy in the student musicians. The main aim of Projects Two and Three was to extend the inquiry into the effects of external focus – firstly to an ensemble concert preparation and performance setting, and secondly to a wider variety of instruments. The findings from Projects Two and Three should of course be extended to larger groups, but in their current form suggest that conservatoires could benefit from integrating external focus instruction and methods into group rehearsals, and also from creating holistic learning environments.

PART III: DISCUSSION, CONCLUSIONS and RECOMMENDATIONS

In the introduction to this thesis, questions were raised about what musicians need to focus on in order to develop their ability to play and perform music convincingly. Declarative and procedural processes were discussed as well as the role of the conservatoire for teaching musicians how to practice. The research questions and hypotheses for the current research centred on the role of attentional focus in artistic practice. Questions concerning the nature of "optimal" focus for musicians, and what characterises external focus for music-making were put forward, leading to the main inquiry: the effects of external focus on learning and on performance.

In this final part, Chapter 8 describes the main findings of the current research, how they address the questions outlined earlier, and how they relate to previous theories and research on attentional focus. Areas for future research are suggested. Chapter 9 discusses the implications of the current research for music pedagogy by re-addressing the theme of procedural processes versus declarative processes, and offers suggestions for a holistic approach to music-making and a reformulated description of the stages of learning based on research on external focus. Areas for future research are summarised. This thesis ends with concrete recommendations for conservatoires about teaching musicians how to practice, and presents a workbook written and developed by the researcher about practicing and teaching practicing.

8

General Discussion of the Research Findings

The main question for the research presented in this thesis is: **How can we characterise external focus for musicians and what are the effects of external focus on musicians' learning and performance?** Characteristics and dimensions of focus were discussed at the beginning of Chapter 2 and the conclusion made is that the most effective focus for complex motor learning needs to be associative (relevant to the task), positive, and anticipatory (see Table 2.1) – i.e. *external focus*. Examples of external focus for musicians were listed in Table 2.2, and all three projects involved the participants engaging in distal, music-related external focus[34] (imagining things like the expression, shape and gesture connected to the music). The practice tool APT was used in all three projects. Projects Two and Three included other 'external focus elements', both in the preparation (rehearsals) for the concert and in the context of the concert performance itself.

The projects used external focus in three main ways: instructions and feedback referred to movement effect and used musical language rather than technical language; methods for practice and rehearsal were based on external focus; and Projects Two and Three were designed to encourage the performers to focus on the meaning of the music during performance.

Results from the three projects tentatively supported the overall hypothesis: **External focus is beneficial to musicians' learning and performance experience.** The hypothesis was addressed by all three projects (designed to be considered as a whole), which yielded both quantitative and qualitative data. Both enhanced learning and enhanced performance were reflected in the accuracy scores from Project One, and also by positive reports from participants in Projects Two and Three about their own performances. Results on the effects of external focus on self-efficacy, confidence and motivation were less conclusive (this is discussed further in the following section). What the current research suggests is that claims that external focus enhances movement effectiveness and efficiency for learning and for performance (Wulf 2007; 2013) could also apply to musicians. There was no indication in any of the results that the external focus methods used were less effective than the participants' usual methods. Unlike most of the research on the effects of external focus on movement, the current study did not compare external focus directly with internal focus, but rather with the participants' "usual" focus during practicing and performing. However, feedback from the questionnaires in all three projects, as well as the practice profile results from Project One, suggest that prior to the projects the participants did not usually rely on

[34] The assumption behind the choice was that distal focus would be more effective (cf. Wulf, 2013, p. 97).

using external focus, but rather on internal focus as well as focusing on technical aspects of the music or on self-focus (e.g. avoiding mistakes or worrying about consequences).

The participant sample in Project One showed a wide distribution of skill and experience levels, suggesting that external focus can be effective for both beginners and more experienced players as well as for learning new repertoire, thus lending support to the claim that external focus can be beneficial for both experts and novices, and for the beginning stages of learning as well as the advanced stages (Wulf, 2007; 2013).

The dependent variables for the three projects were **accuracy, self-efficacy**, **confidence, motivation**, **engagement, satisfaction, enjoyment** and **ensemble playing.** Results from Project One showed that external focus had a positive effect on accuracy. The results for self-efficacy, although suggesting a positive trend for performance self-efficacy, were not conclusive. To have clearer results, there would need to be more extensive research on the effects of external focus on self-efficacy and over longer periods of time. The same could be said of motivation – results did not indicate that external focus improved motivation in Project One, and there are not enough data from Projects Two and Three to indicate how the participants' motivation was affected. Anecdotally, a higher than usual level of enjoyment, engagement and confidence was apparent in all three projects. Statistical results suggested a positive trend for engagement and confidence in Project One, and this was further supported by verbal reports from interviews in Project Two and the post-performance report after Project Three.

One of the most striking features from the studies was how much the participants seemed to be absorbed in the process of exploring music-making and how (based on the analysis of their qualitative answers) they themselves were surprised at the extent of the positive results of the performances (in both Projects Two and Three). This contrasted with the fact that many of them were very uncomfortable with singing and gesturing the music in rehearsals (and even alone in a practice room). In spite of their discomfort – several admitted to believing that APT was beneficial and even asked for it during difficult sections in rehearsals. Because of using APT (i.e. singing and gesturing), less time than usual was spent actually playing, which both worried some participants (during the process) and surprised them in that they improved nonetheless.

Several participants in Projects Two and Three mentioned in their interviews that they noticed a marked improvement in ensemble cohesion – supporting Keller's suggestion that ensemble cohesion could be positively affected by using anticipatory musical imagery and by being familiar with each others' parts (Keller, 2012). In addition, participants reported lower performance anxiety for the performances as well as more connection than usual with the music, the audience and the message behind the music. Low performance anxiety was an unexpected result – and was probably due to the high engagement/absorption levels (i.e. task

focus). This result corresponds with claims by Wulf and Lewthwaite (2016) and Kenny (2011) that focussing on the task, rather than on the self, can enhance performance and lower anxiety. Masters makes a similar claim: that learning with implicit methods (e.g. involving external focus) can help one to perform well under pressure (Masters, 2014).

The approach to practice, rehearsal and performing presented was novel and interesting for the participants in general. To what extent did the participants of the current study continue to use the methods presented to them? The seven participants from Project One and Two did continue to use APT (or elements of it) several weeks after the project (see Table 6.5 and Appendix P). Participants who answered the questionnaire after Project Three reported that they gained a new understanding about how to approach music making and a desire to try out new strategies based on those they experienced in the project e.g.: "The gesturing and singing worked much better than I would have thought, and I will try to use this in my own playing"; "I learnt some rehearsal techniques, which I will definitely introduce into my future practice. Also the ideas on affects opened up more rhetoric possibilities and I am interested to read up on them further" (see Table 7.1 and Appendix S).

The extent to which the participants continued to use external focus during their practice and performance would require a longitudinal study.

The OPTIMAL theory revisited

As mentioned in Chapter 2, Wulf and Lewthwaites' OPTIMAL theory suggests three factors that enhance motor learning: autonomy, enhanced expectancies and external focus. The research presented here supports the claim that external focus is beneficial – also in the case of musicians. During all three projects, external focus was introduced in a way that also promoted autonomy. Rather than being told what they should focus on, the participants were invited through gesturing, singing and making variations to find their own images and movements to express the music. By doing so they were thus engaging in positive task focus by using APT. The OPTIMAL theory seems very applicable for musicians' practice.

The aim of the current study was to investigate whether external focus could benefit musicians in general. The projects were designed firstly to look at the effects of external focus on natural trumpet players (as the effects are relatively easy to judge), and then to see if the benefits of external focus can extend to the preparation and performance of an ensemble project (Project Two) as well as to other instruments (Project Three). Results from Projects Two and Three indicated that external focus can be effective for preparing ensembles and are of benefit to musicians in general, not only trumpeters. Whether there are specific ways to use external focus for different instruments, or for singers or other performing artists is a question that would need further research.

This study is an example of how science (theories and empirical research on motor learning and attentional focus) can inform the practice of music-making. It is also an example of how artists and artistic research can contribute to science. Using external focus in a way that generates complex, sophisticated imagery promoting creativity and autonomy could bring benefits not only to other performing arts but also to other domains such as rehabilitation and sports.

Limitations and Recommendations for Future Research

There is a great deal we still don't know about attentional focus and imagery in the field of music-making and music pedagogy. The limitations in the current study relate mostly to the complexity of music-making – that it involves subjectivity and needs qualitative as well as quantitative results to give a full picture. As mentioned in Chapter 5, the kind of experiment described in Project One would benefit from more than seven participants, and the close monitoring of all of the rehearsal segments (e.g. by audio or audio-visual recordings and self reflective audio reports before and after each practice session). Projects Two and Three would also have benefitted from more monitoring. All participants would need to participate in every aspect of the project, as well as give feedback (this was particularly a problem in Project Three). Project Three would also have benefitted from a post project interview with each participant similar to the one made in project Two. The design of both Projects Two and Three would be improved by having a control element, where similar projects were done using "usual" practice, rehearsal and performance preparation methods.

External focus was tested in the current study in the form of the APT practice tool and in an environment that encouraged participants to engage in external focus, each in their own way. Future research could look more specifically at the effects of different kinds of external foci and imagery in order to see if some are more effective than others; if it differs from person to person or for different kinds of instruments; the effects of proximal versus distal external foci. Research into how external focus can be of use during each stage of learning would be useful, as well as for teaching children and amateurs; how motivation can be enhanced by external focus techniques and how using external focus could change practice behaviour in general. There still needs to be more information about how and to what extent expert musicians use internal and external foci.

9

Conclusions: Approaching Practice and Performance

Over the last decade there has been an increase of convincing evidence of the effectiveness of implicit motor learning and procedural processes for learning (even for early stages of learning), instead of learning in a verbal declarative way. The results of the current research agree with this view, suggesting that an emphasis on implicit procedural learning could also benefit musicians. This would imply that musicians should shift their focus from the outcome of their music-making (perfection and success) to their musical intention (expression). This is not to say excellence, perfection and success are not important, but rather, that they are *side effects* of being totally engaged in the activity of music-making.

A theme that emerged during this research was the importance of connectivity. First year students, quoted in the introduction of this dissertation, mentioned that playing music made them feel connected – with themselves, with music and with each other. Practices that connect the senses and engage more areas of the brain (i.e. vivid multimodal methods) and putatively reduce cognitive load (imagery versus verbal information) should be encouraged. The present research shows that interpersonal connectivity within ensembles also benefits from using musical imagery and external focus in general. Presumably enhanced connectivity in individuals and within ensembles would also have the effect of better communication with the audience.

This chapter outlines a holistic approach to motor learning and motor control for musicians that reflects the findings of the current research. Implications and recommendations for how to train musicians are outlined, and the role of the conservatoire is discussed.

A Holistic Approach to Learning and Performing

Music-making is a complex multi-modal activity (Altenmüller, 2008) and needs a complex multi-modal approach (Schaefer, 2017). There is still not enough knowledge and adequate explanation of the mechanisms behind motor learning and motor control: "It is time the motor learning field developed a new theory for motor learning" (Schmidt, 2003, p. 373). Wulf and Lewthwaite's OPTIMAL theory of motor learning seems to offer a more comprehensive explanation about how complex movements are learned and performed than do earlier theories. The current research suggests that music-making could be viewed as involving a self-organising system that can benefit from the use of external focus. Applying an external focus reduces cognitive control and thus the degrees of freedom problem[35] is optimized automatically by the motor system without requiring additional cognitive resources.

[35] (see *degrees of freedom* in Chapter 1)

The question for a musician is not "How does it work?" but rather: "What do I need to do in order for it to work?" A musician does not need to understand the workings of his muscles, nerves and neurons or to be instructed what movements to make (Masters, 2012; Wulf, 2007; 2013; Wulf & Mornell, 2008) but rather have an exploratory and holistic approach to practicing and performing in which mind, body and emotions cooperate to get the best results. Ideally, the mind is concerned with external focus on musical elements (rather than with things like analysis, judgement, internal focus, comparison, worry about consequences, and distraction) in order to allow the body's implicit mechanisms to learn or remember the appropriate movement. External focus – or focussing on musical intention – can be informed by the emotions – i.e. the performer's own emotions (connected with the music) or the emotions embedded in the music.

Figure 9.1 expands the concepts illustrated in Figure 0.4 from the introduction, showing a paradigm where the musician himself is the instrument, and highlights the important role of emotion in music-making. This dissertation opened with an example of the discrepancy between how conservatoire music students view their reasons for playing music and the way they approach practice. The theoretical chapters highlighted theories and research that suggest that complex motor skills are best learned implicitly and that external focus can facilitate this process. The main research question starts by asking how we can characterise external focus for musicians. External focus for musicians is *music*: focussing on expression and communicating through sound. Focussing externally can involve using auditory musical imagery, metaphors, gestures, a narrative, or focussing on kinaesthetic elements of the desired goal. A rich multimodal approach is likely to get the best results.

The conclusion of this dissertation is that we need to teach musicians how to explore expression, rather than striving to understand and consciously control the mechanics of music-making. Technique and expression need not be separated and dissected, but rather can inform each other in order to achieve "ideal music".

Figure 9.1 A Holistic Model of Music-making

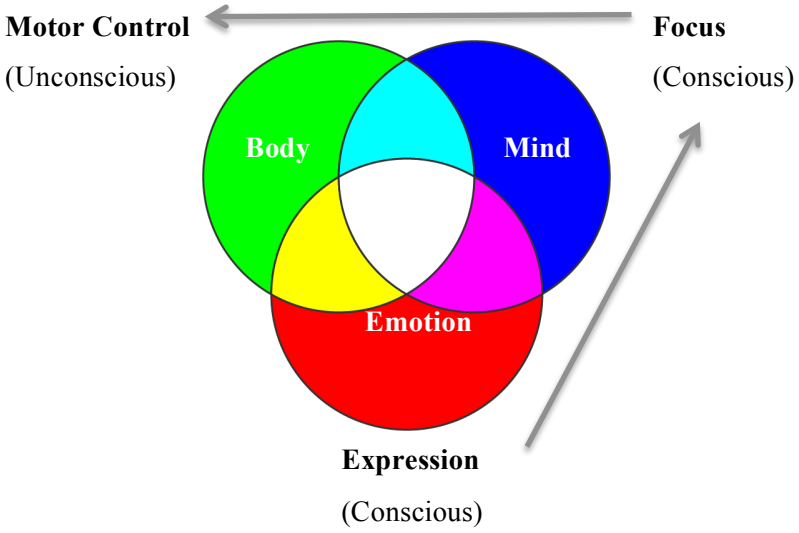

Figure 9.1 illustrates how body, mind and emotion can interact in an optimal way to support complex motor learning. Rather than being used for thinking about, analysing and steering the body's movements (i.e. internal focus), the mind is focussing on the intended musical effect. Musical effect is informed not just by imagining sound, but mood and emotion. In this way emotion is informing the mind. The minds' focus is, in turn, informing the body's implicit mechanisms so that learning or performance can take place without too much disturbance of analytic thought and judgements. The space in the centre, where body, mind and emotion are all present, represents a balanced centre where a state of "flow" or total engagement can be achieved.

The Three Stages of Learning Reformulated

In Chapter 1, motor learning was described in three stages: the "cognitive/declarative" stage, the "associative" stage, and the "autonomous" stage. To summarise the mainstream view: the early stage requires cognitive declarative processes in order to understand the skill, and gradually through the learning process automaticity is achieved, until it would be no longer necessary to control the movements consciously. In the light of the research presented here, the stages of learning could be considered in a way in which external focus plays a prominent part in every stage of the journey.

The Early Stage involves understanding the task by formulating intentions. Intentions can be formulated through making decisions about what is to be learned and what the desired results should sound and feel like, as well as developing a sense of the meaning behind and the emotions connected with the piece (if one is learning repertoire). A piece of music would be played slowly or in small chunks. Strategies can then be designed for achieving the intended goal / goals. The early stage can also involve organisation – taking care that everything that is needed is available and organised. Cognitive, declarative processes are used for organising and making learning strategies and goals rather than steering movements.

The Middle Stage is characterised by exploration. This stage involves creating an environment for exploration by choosing tools and methods that enhance getting to know the

skill or piece better by developing sensory awareness and exploring musical intention – e.g. by using external focus tools or by improvisation. Important in this stage is also the development and use of self-regulation and reflection. Sections of music would be gradually chained together.

The Final Stage is about finding the "flow state". When a piece or skill is learned, a musician needs to practice trust and the ability to focus on musical details as well as the larger picture. This is achieved by relying on using rich musical imagery and distal external focus during the whole piece. The goal of practice at this stage is on staying engaged (in focus) as well as practicing recovery (how to stay on track after an error or distraction).

Training Performing Musicians

The main implication of the current research is that clear musical intention is vital to music-making and is a pre-requisite for a reliable technique, and that musical intention can and should be trained. The ability to imagine clearly and vividly improves with practice. Asking the question "What do I want to say here?" is very different from trying to solve a technical problem and results in an explorative, procedural process. An example would be to use "varied practice" (as described in Chapter 3) which can produce a much more nuanced (and musically complex) result than a purely technical approach. The "self organisation" that accompanies exploratory practice will help to achieve goals more effectively and efficiently than will relying on declarative processes. Music then informs technique. Although one of the main goals of a musician is to play accurately, accuracy is better achieved by focussing on musical intention. A clear musical image includes the right notes, rhythm and dynamics. Thus accuracy and facility is a side effect of external focus.

Methods such as APT, varied practice and improvisation are but a few of the tools that can enhance learning by exploring expression and using external focus. These and other methods are described in detail in the publication *Quality Practice* presented at the end of the current thesis. The goal of practice should be to find ways to enhance engagement and motivation and to find the right focus to achieve concrete goals (see *Quality Practice* for a detailed explanation), and to *practice intention*. Rather than giving answers in the form of instructions, rules and information that can lead to cognitive overload, teachers could ask more questions and offer suggestions and encouragement to help students explore and find their own solutions and their own voice. The methods described above encourage autonomy, as the students have to find their own interpretations and not just follow instructions or mimic the teacher. The practice room and the teaching studio should be a place for 'learning to learn'.

External focus is not a new concept. It is a new term for what good musicians have always done: focussing on music and the meaning embedded within the music. Studies like those of Trusheim (1991) and Buma et al. (2014) imply that successful musicians rely on external

focus and audiation to perform and to prepare performances. Mornell & Wulf's study (2019) supports this assumption. What could be developed, however, is that the use of external focus could be more explicit (i.e. not tacit) and prominent in teaching and in practicing – that we develop methods and approaches that encourage external focus in learning and teaching and during practice and rehearsal, as well as developing explicit ways to rely on external focus during performance – even when under pressure.

The Role of Conservatoires

One of the main tasks of a conservatoire is to teach musicians how to practice (as mentioned by Jørgensen in the introduction of the current thesis) (Jørgensen, 2009). Teaching musicians how to practice needs to be embedded in the curriculum, and main subject teachers themselves need to be informed about practice methods and strategies, and even current theories and research on learning and performance.

Conservatoires could shift their goals from producing technically finished performers to training expert learners and musicians who can express themselves clearly, and who are equipped to continue and steer their own development. One-to-one lessons can be enhanced by the creation of learning environments that offer rich, holistic, multimodal ways of practicing, preparing performances, rehearsing and performing. Projects similar to Projects Two and Three described in the present research can be implemented to encourage procedural learning where musicians are engaged in exploration rather than in problem solving. A "Study Lab Project" carried out by Bakker, Kouwenhoven, Schuijer, and Oudejans (2016) bears some similarity with Project Three in the current study. The researchers created an intensive learning environment for music students to use techniques connected with deliberate practice, external focus, use of imagery, and performance preparation. The emphasis was on quality rather than on quantity of practice. The project reported positive reactions from the students and suggests the importance of creating environments and opportunities within conservatoires to help musicians explore and develop new ways to practice and prepare their performances.

The main elements behind effective practice and projects are outlined in Wulf and Lewthwaite's OPTIMAL theory – *autonomy*, *enhanced expectancies* and ***external focus***. In a staff development seminar at the Royal Conservatoire of The Hague, which took place in March 2018, the researcher explained to 25 teachers (including both instrumental and theory teachers, as well as two dance teachers) the theory behind implicit learning and the OPTIMAL theory, and then asked them what the implications and applications could be for their teaching.[36]

On the subject of **implicit motor learning** the responses from the teachers included the following implications and applications: "Learning through modelling"; "Look for musical

[36] See Appendix Z for the entire document from the seminar

and expressive terms rather than technical ones"; "Avoid verbal and technical instructions"; "Learn to accept mistakes"; "Learn to let go of needing to intellectually understand or control everything".

The theme of **autonomy** generated the following responses: "Ask questions"; "Limit feedback and let the student lead the feedback"; "Encourage the students to look for their own musical ideas"; "Check what the student wants to learn"; "Let the student choose repertoire"; "Help the student feel ownership of their process and not just focus on the result (or grade)". The conclusion was: *Students need to develop agency by realising that they are responsible for their own process and that they have choices. Many individuals want or need some external rules and structure and extrinsic motivation. Self-regulation and self-reflection can be learned.*

Implications and applications of **enhanced expectancies** included: "Point out when something works/goes well"; "Learn to enjoy challenge"; "Build your expertise by choosing challenging but do-able goals"; "Mistakes are part of the game and provide valuable information". The conclusion was: *The role of the teacher is to help the student choose challenging but achievable goals and to recognise when they are met, leading to an accumulation of "mastery experiences" resulting in self-confidence and motivation.*

On the subject of **external focus** implications and applications included: "Encourage students to practice musical intention: e.g. 'What do I want to sound like/say?' and 'What do I want the listener to feel?'"; "Use metaphors and analogies"; "Make narratives or invent scenarios or subtexts"; "Think of words to go with a phrase to make it more meaningful"; "Practice variations – vary the entire character of the phrase"; (Dancers) "Focus on fluency, phrasing and expression. Imagine images and metaphors, explore the space and dance 'musically' – even when there is no sound present". The conclusion was: ***Encourage students to practice by getting to know more clearly what they want to say, what the audience should feel, what effect they want to make and what emotions are embedded in the music. Notice how clarifying musical intention affects technique*** (See Appendix W for detailed documentation).

The implications for one-to-one teaching are that teachers could complement their practice of giving instructions (i.e. teaching methods) with asking questions (i.e. coaching methods) relating to task focus. Students could be encouraged to find and develop their own ways to explore and get to know their repertoire and skills. Insights, methods and strategies that come from the students themselves will have a stronger effect than being given the information. Using tools like APT encourages students to find their own task focus that is rich (involving nuance and variations) and multimodal (incorporating gesturing, singing and imagining), thus using external focus in a way that involves and enhances the students' autonomy.

Future Directions

The research approach in the current study contrasts to the laboratory controlled studies made by Wulf and colleagues (Wulf, 2013). There are several significant differences between the previous studies on attention focus effects on musicians (Duke et al. , 2011; Atkins & Duke, 2013; Atkins, 2017; Mornell & Wulf, 2019 – described in Chapter 2) and the current study.

In the current study, qualitative measures including subjective self-ratings, were collected to ascertain not only technical and musical results but also the subjective experience of the participants in a rich naturalistic setting. Focus was not specified with instructions but rather, the participants were put in the position of exploring their own version of the desired result (external focus) of their music-making through the use of the APT tool and by the design of the projects. Not only was performance addressed but also learning (as well as self-efficacy, confidence and motivation). The aim of the current study was not to compare internal focus with external focus, but rather to determine how external focus methods can be integrated into practicing, preparing concerts and performing and whether this was effective and different from participants' normal behaviour and experience.

One of the reasons for the present study is that there is not much research on musicians' motor learning. Studies involving musicians, cognitive scientists and pedagogues could bring much needed knowledge about how external focus and musical imagery can enhance learning and performance, as well as about how it can be learned or taught. Research that looks into what kinds of external foci are effective for musicians and how distal the focus needs to be in specific cases would be useful.

More longitudinal studies on the applications and the effects of external focus are needed, using large numbers of participants. Studies on how to influence practice behaviour in (student) musicians would be valuable as well as how to develop a healthy culture of practice in conservatoires. Considering the complex nature of music-making, it could be beneficial to have multi-disciplinary and cross-disciplinary research to find out more about how music-making works, and with it how to optimize not only performance but also performing experience.

10

Disseminating and Applying Research on Musicians' Motor Learning to Musicians and their Teachers

Researching the question of what to focus on during music practice and performance has led me on an interdisciplinary journey into fields where I am not an expert (movement sciences, music psychology and neuroscience). My aim was to be able to present the relevant theories, concepts and research findings well enough, and also clearly enough, for musicians and people who train musicians to understand. The designs I made to explore external focus are only examples of the infinite number of ways that external focus can be used, explored and researched in the field of music. There is a real need to develop holistic ways to train musicians by designing learning environments that encourage exploration and connectivity (neural, inter-personal and interdisciplinary). It could be that the mindset of our institutions needs to shift – away from result-oriented to process-oriented goals in order to encourage student musicians to practice in a more effective and efficient way. Although external focus means focussing on the intended result of one's actions, this should be interpreted not in terms of gain or of quantifiable results, but in clarity of expression and successful communication.

Bridging Science and Musical Practice

Quality Practice – A Musician's Guide is an additional outcome of the research presented in this thesis. It was written and designed to showcase in a concrete and practical way the current knowledge about motor learning for musicians. Through navigating scientific studies on motor learning, being excited and inspired about the significance of many of the theories and findings for musicians, I came to realise that much of the valuable information remained in the domains of science and did not necessarily permeate into practice (this is perhaps less so in the fields of sports or rehabilitation). I recognised the need for a bridge between relevant information on the nature of motor learning and musicians' practice rooms, teaching studios and the stage. During the process of putting together a workbook and online manual that could benefit musicians, I became aware that several things are important: that the information presented is clear and easy to grasp even for someone without a scientific background; that the knowledge presented is empirically based; that the implications of each topic are stated and there are clear examples of how the information can be immediately applied and experienced; that the manual is attractive and easy to use without being superficial in content; that work-forms are presented to use as teaching/learning materials; that references for each topic are available for those who want more intellectual understanding.

There has been ample feedback from teachers and musicians – sometimes recognising new and useful knowledge and ways to implement it but, more often than not, reports of confirmation of what many are already doing or observing. Many teachers and musicians have a great deal of intrinsic knowledge and wisdom, and can benefit from it being confirmed by the scientific world. Strengthening a dialogue between science and art could surely benefit both.

Figure 10.1 Quality Practice – A Musician's Guide

See separate pdf file for the entire document.

FINDING FOCUS: Summary

Recent research on attentional focus suggests that an optimal focus for learning complex movements involves focussing on the intended outcome of the movements rather than the movements themselves. This *external* focus has been researched and applied in sports and movement sciences but is not yet widely understood, or applied to the field of the performing arts.

The question for a musician "what do I need to focus on for optimal learning and performance?" is the topic of this research. Theories and findings on motor control and attentional focus are examined and external focus of attention is translated into musical contexts. Three interventions were designed to see how external focus works in a complex artistic environment. The findings imply that teachers of musicians need to develop ways to train their students to pay more attention to their musical intention and not only on their physical movements or on the technical aspects of the music.

The dissertation is divided into three parts.

Part I – Making Music (Chapters 1-3) – presents a literature review of relevant theories and research on motor learning and attentional focus. Conclusions from the review point out that music-making involves complex motor control and that results from research into implicit motor learning and external focus of attention suggest that external focus could be of benefit to musicians. Audiation is defined and proposed as an example of external focus for music-making, and a practice tool based on audiation is designed and then used in three empirical projects/interventions.

Part II – Focussing on Musical Intention (Chapters 4-7) – presents the three empirical projects in which the audiation practice tool is evaluated experimentally.

Part III – Discussion, Conclusions and Recommendations (Chapters 8-10) – here the combined results of the projects are then compared with the existing research on external focus to determine whether external focus is beneficial for learning and performing music, and whether there are some new insights into external focus of attention from a study based on musicians.

A brief description of each chapter follows.

PART I: Making Music

Chapter 1 – Learning Motor Skills – explains that music-making is a psychomotor activity involving motor learning. The nature and aspects of motor learning are explained, and the main current theories of motor learning are presented and discussed. Of particular interest and importance is the implicit motor learning theory – a theory put forward by Richard Masters, which claims that movement skills are better learned without much declarative knowledge or

conscious cognition. The three stages of learning are described, and the role of attention in motor learning is discussed –in particular the question of what kind of attention is recommended for each stage of learning. Conclusions from Chapter 1 raise doubts about the efficacy of declarative learning – even in the early stage of skill acquisition.

Chapter 2 – Attentional Focus for Learning and Performance – discusses attentional focus and presents in detail the relevant research and findings on external focus. The chapter concludes with a report on research about external focus in the performing arts and presents ideas about how external focus can be applied to music-making.

In Chapter 3 – Audiation: Practicing Musical Intention – audiation is proposed as a form of external focus for music-making. Audiation is defined and described as the use of musical imagery, singing, use of gesture and practicing variations as a way to practice exploring and clarifying the musical intention of the player. The chapter forms a basis for the design of a practice tool – APT (Audiation Practice Tool) – to be used in the three empirical projects.

PART II: Focussing on Musical Intention: Three Empirical Projects

Chapter 4 – An Overview of the Projects – presents three empirical projects that explore the effects of external focus on musical learning and performance. A brief description of each project is followed by the research questions and hypotheses as well as an explanation of how external focus is used in each project.

Chapters 5, 6 and 7 – describe each of the three projects respectively. Aims, subjects, methods and measures, procedure, results, analysis and conclusions are presented for each of the projects. Project One asked "What are the effects of external focus on the accuracy and confidence of natural trumpeters?" using a mixed methods intervention. The results showing the benefits of the external focus tool compared to the participants' usual way of practicing were around the threshold of significance for accuracy and there were positive trends for self-efficacy for performance and for confidence. Project Two investigated how external focus affected the preparation and performance of a trumpet consort concert (the seven participants from Project One also participated in Project Two). Qualitative data was collected in this project, revealing that the participants were more engaged and suffered less nervousness than usual during performance. Project Three involved a mixed ensemble of string players, trumpeters and keyboard players in a workshop and performance of instrumental music. Again, external focus was at the centre of the pedagogy and methods used in the project, and the participants were asked for their feedback. The results revealed that several of the participants experienced a positive "out of the ordinary" concert experience, as well as positive reactions to approaching rehearsals and concert preparation with external focus.

PART III: Discussion, Conclusions and Recommendations

Chapter 8 – General Discussion of the Research Findings – connects the theory and research presented in the literature review with the findings from the present study (including all three empirical projects), revealing what this study can confirm and suggesting further areas for research.

Chapter 9 – Conclusions: Approaching Practice and Performance – argues a holistic approach to music-making. The three stages of learning that were described in the literature review in Chapter 1 are reformulated to reflect how implicit learning and external focus can be used to benefit the learning and performing process.

Chapter 10 – Disseminating and Applying Research on Musicians' Motor Learning to Musicians and their Teachers – reflects the motivation behind the research presented in this thesis as well as illustrating a way of presenting information about psychomotor learning in such a way that it can be readily used in the practice room, in the lesson and on stage. A workbook for musicians – *Quality Practice* – written by the researcher is presented as an example of applying research and findings from psychology, pedagogy and neuroscience about motor learning to music-making. A central theme of this workbook is the role of attention throughout the learning process. Making relevant empirically based knowledge available and accessible for musicians can thus encourage new and innovative ways to practice, learn and perform.

FOCUS VINDEN: Samenvatting

Recent onderzoek naar aandachtsfocus wijst erop dat de optimale focus voor het leren van complexe bewegingen is om op de bedoelde uitkomst van de bewegingen te concentreren, in plaats van op de bewegingen zelf. Deze *externe* focus is in sport- en bewegingswetenschappen onderzocht en toegepast, maar is nog niet in brede kring bekend, en nog niet toegepast op het terrein van de uitvoerende kunsten.

Onderwerp van deze studie is de vraag voor een musicus: 'Waar moet ik op focussen om optimaal te kunnen studeren en voor publiek te spelen?' Theorieën en conclusies over motorische controle en aandachtsfocus worden onderzocht en externe aandachtsfocus wordt vertaald naar de muziekpraktijk. Drie interventies werden ontworpen om te zien hoe externe focus in een complexe artistieke omgeving functioneert. De uitkomsten suggereren dat muziekleraren manieren moeten ontwikkelen om hun leerlingen meer aandacht te laten schenken aan hun muzikale intentie, en niet alleen aan hun fysieke bewegingen of de technische aspecten van de muziek.

Deze dissertatie is in drie delen verdeeld:

Deel I – Muziek maken (Hoofdstukken 1-3) – bevat een literatuurstudie van de relevante theorieën en onderzoek op het gebied van motorisch leren en aandachtsfocus. Uit deze studie blijkt dat bij muziek maken complexe motorische beheersing betrokken is en dat de resultaten van onderzoek naar impliciet motorisch leren en externe aandachtsfocus erop wijzen dat musici baat kunnen hebben bij externe focus. Audiatie wordt gedefinieerd en opgevoerd als een voorbeeld van externe focus voor het maken van muziek, en er wordt een oefenmethode op basis van audiatie ontworpen, die vervolgens gebruikt wordt in drie empirische projecten/interventies.

Deel II – Focussen op muzikale intentie (Hoofdstukken 4-7) – beschrijft drie empirische projecten waarin de audiatie-oefenmethode experimenteel geëvalueerd wordt.

Deel III – Discussie, conclusies en aanbevelingen (Hoofdstukken 8-10) – hierin worden de gecombineerde resultaten van de projecten vervolgens vergeleken met bestaand onderzoek naar externe focus om te bepalen of externe focus nut heeft voor het leren en uitvoeren van muziek, en of een studie op basis van musici nieuwe inzichten biedt op het gebied van externe aandachtsfocus.

Hieronder volgt een korte beschrijving van elk hoofdstuk.

DEEL I: Muziek maken

Hoofdstuk 1 – Motorische vaardigheden aanleren – legt uit dat muziek maken een psychomotorische activiteit is waar motorisch leren bij betrokken is. Het wezen en bepaalde aspecten van motorisch leren worden uitgelegd, en de voornaamste courante theorieën van

motorisch leren worden geïntroduceerd en besproken. Van bijzondere interesse en belang is de theorie van het impliciet motorisch leren van Richard Masters, die stelt dat motorische vaardigheden beter worden aangeleerd zonder veel declaratieve kennis of bewuste cognitie. De drie leerfases worden beschreven, en de rol van aandacht in motorisch leren wordt besproken, in het bijzonder de vraag welke vorm van aandacht voor elke leerfase aan te bevelen is. De conclusies uit Hoofdstuk 1 plaatsen vraagtekens bij de doeltreffendheid van declaratief leren, zelfs in de vroege fase van het aanleren van vaardigheden.

Hoofdstuk 2 – Aandachtsfocus voor leren en uitvoeren – bespreekt de aandachtsfocus en geeft een gedetailleerde beschrijving van relevant onderzoek over externe focus en de uitkomsten ervan. Dit hoofdstuk besluit met een overzicht van onderzoek op het gebied van externe focus in de uitvoerende kunsten en geeft ideeën over hoe externe focus op het maken van muziek kan worden toegepast.

In **Hoofdstuk 3 – Audiatie: muzikale intentie oefenen –** wordt audiatie voorgesteld als een vorm van externe focus voor het maken van muziek. Audiatie wordt gedefinieerd en beschreven als het gebruik van muzikale beelden, zingen, gebaren en het oefenen van variaties als manieren om te oefenen met het verkennen en verduidelijken van de muzikale intentie van de musicus. Dit hoofdstuk vormt de basis voor het ontwerp van een oefenmethode – APT (Audiation Practice Tool) – die in de drie empirische projecten wordt gebruikt.

DEEL II: Focussen op muzikale intentie: drie empirische projecten

Hoofdstuk 4 – Een overzicht van de projecten – zet drie empirische projecten uiteen die de effecten van externe focus op het leren en uitvoeren van muziek verkennen. Een korte beschrijving van elk project wordt gevolgd door de onderzoeksvragen en -hypothesen en een verklaring van hoe externe focus in elk project gebruikt wordt.

Hoofdstukken 5, 6 en 7 – beschrijven elk een van de drie projecten. Voor elk project worden de doelen, proefpersonen, methodes en maatregelen, procedures, resultaten, analyses en conclusies uiteengezet. Project Eén stelde de vraag: 'Welk effect heeft externe focus op de accuratesse en het zelfvertrouwen van natuurtrompettisten?' aan de hand van interventie met gemengde methoden. De resultaten die de voordelen van de externefocusmethode ten opzichte van de normale wijze van studeren van de deelnemers tonen, zaten rond de drempel voor significantie voor accuratesse en er waren positieve trends met betrekking tot zelfeffectiviteit voor uitvoering en zelfvertrouwen. Project Twee onderzocht welke invloed externe focus had op de voorbereiding en uitvoering van een trompetconsort (de zeven deelnemers aan Project Eén namen ook deel aan Project Twee). In dit project werden kwalitatieve data verzameld, waaruit bleek dat de deelnemers meer betrokken en minder zenuwachtig waren dan anders tijdens een uitvoering. Project Drie bestond uit een gemengd

ensemble van strijkers, trompettisten en klavierspelers in een workshop en een uitvoering van instrumentele muziek. Ook hier stond externe focus centraal in de in het project gebruikte pedagogiek en methodes, en de deelnemers werd om feedback gevraagd. De resultaten wezen uit dat verschillende deelnemers een positieve 'buitengewone' concertervaring hadden en positief reageerden op het gebruik van externe focus bij repetities en concertvoorbereiding.

DEEL III: Discussie, conclusies en aanbevelingen

Hoofdstuk 8 – Algemene bespreking van de onderzoeksbevindingen – verbindt de theorie en het in de literatuurstudie gepresenteerde onderzoek met de conclusies uit de onderhavige studie (inclusief de drie empirische projecten), en maakt duidelijk wat deze studie kan bevestigen en aan nieuwe onderzoeksgebieden kan aanreiken.

Hoofdstuk 9 – Conclusies: benadering van oefenen en uitvoering – pleit voor een holistische benadering van het spelen van muziek. De drie leerfases die in de literatuurstudie in Hoofdstuk 1 werden beschreven, worden geherformuleerd om aan te geven hoe impliciet leren en externe focus kunnen worden gebruikt om het leer- en uitvoeringsproces te bevorderen.

Hoofdstuk 10 – Verspreiding en toepassing van het onderzoek op het motorisch leren van musici en hun leraren – geeft de motivatie achter het in deze dissertatie uiteengezette onderzoek weer en illustreert ook hoe informatie over psychomotorisch leren zodanig aangeboden kan worden deze direct kan worden ingezet in de oefenruimte, in de les en op het podium. Een werkboek voor musici – *Quality Practice* – van de hand van de onderzoekster wordt gepresenteerd als een voorbeeld van het toepassen van onderzoek en conclusies over motorisch leren uit de psychologie, pedagogiek en neurowetenschappen op de muziekleerpraktijk. Een centraal thema van dit werkboek is de rol van aandacht in het gehele leerproces. Het aanbieden en toegankelijk maken van relevante empirische kennis voor musici kan zo nieuwe en vernieuwende oefen-, leer- en uitvoeringsmethodes stimuleren.

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CURRICULUM VITAE

Susan Williams was born in Canberra, Australia in 1960 and began her musical life singing in choirs and vocal ensembles. She started playing the trumpet as a teenager. After obtaining her bachelor degree at the Canberra School of Music in 1982, Susan went to Sydney where she was a member of the National Training orchestra for several years before travelling to Europe to continue her studies. She obtained her Uitvoerend Musicus degree at The Royal Conservatoire of The Hague in 1998 and her love of baroque music led her to go on to specialise in early music.

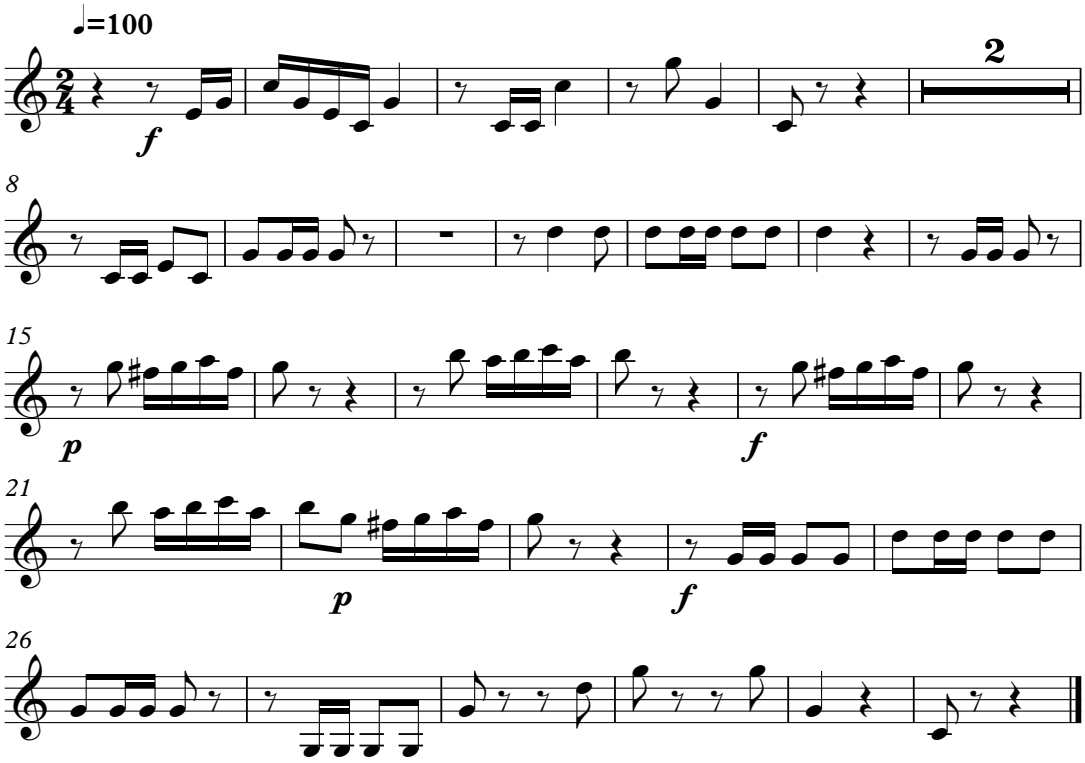
Susan is now one of the world's most well known specialists on the baroque trumpet and over the last 30 years has performed and recorded with many of Europe's finest early music ensembles as soloist, chamber musician and in orchestral projects. She has also initiated and realised many of her own artistic projects involving natural trumpets. She has taught since 1988 at The Royal Conservatorium of The Hague and since 2004 at the University of the Arts in Bremen

In addition to teaching natural trumpet and leading ensemble projects and workshops Susan has been giving regular courses in practicing and performance preparation for over ten years. Susan is actively involved in curriculum development in the area of training practicing both in The Hague and in Bremen. She teaches in staff development programs in The Netherlands, Belgium and Austria and for the *Netzwerk Musikhochschulen* of Germany. Her research has revolved around the topics of attentional focus and musical imagery.

APPENDICES

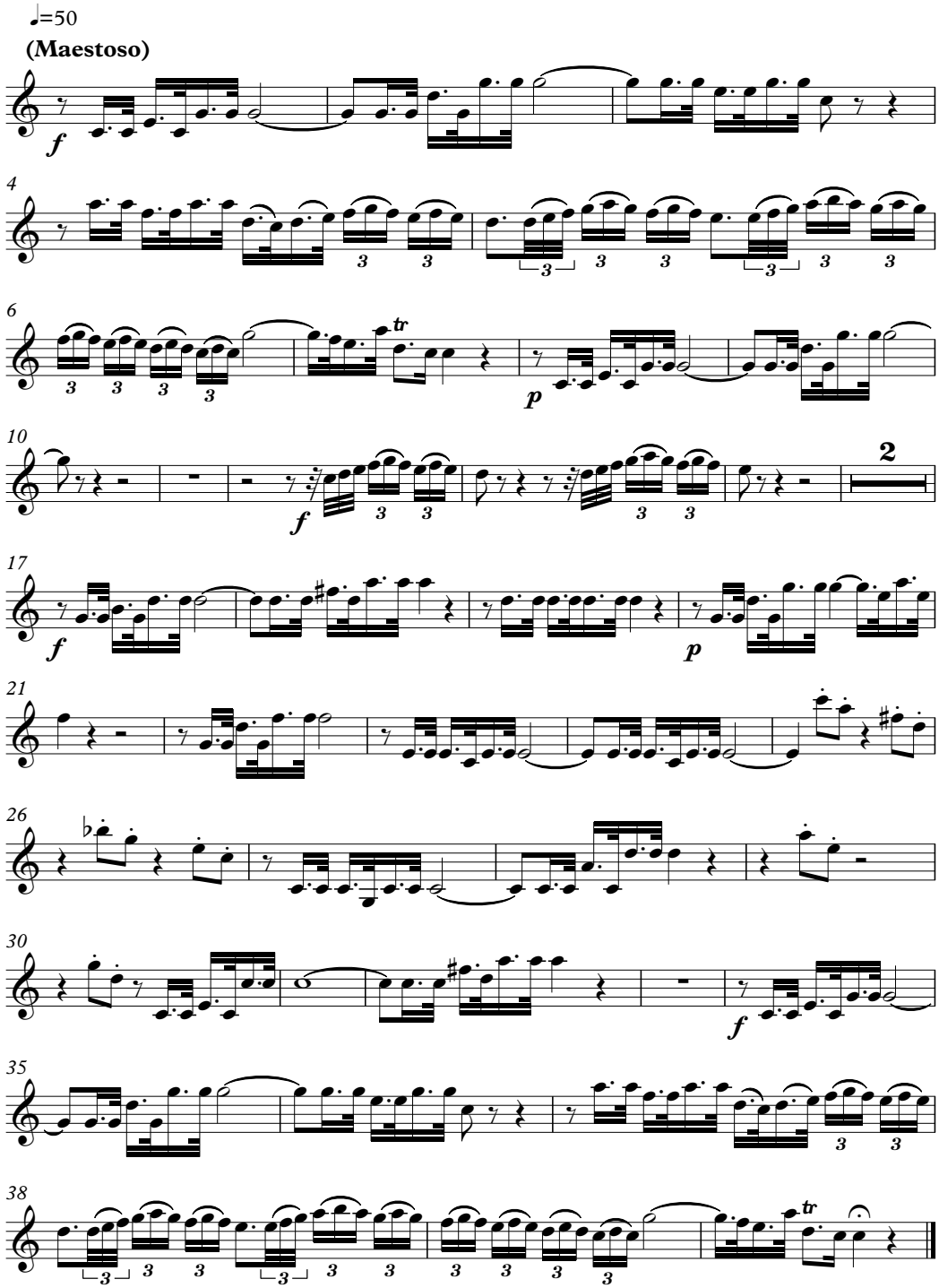
Appendix A Test Pieces

GROUP A
Piece 1



Technical challenges:
Difficult entrances
High range
Low range
Large intervals

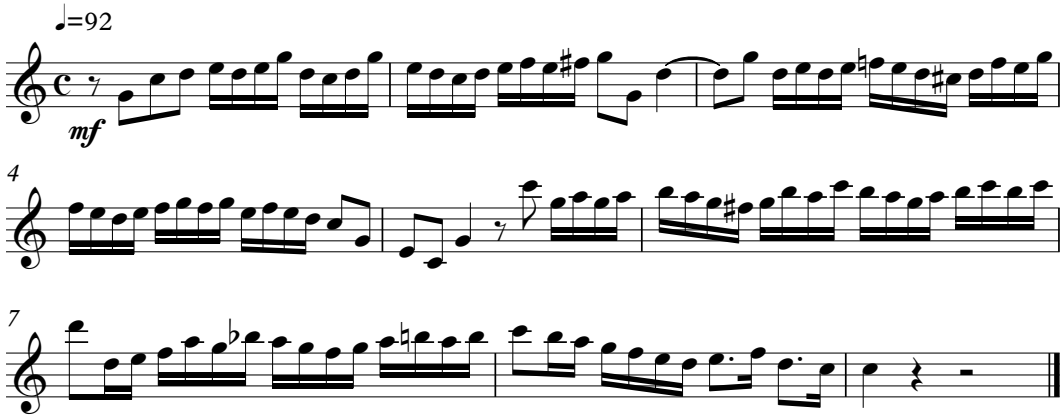
[Group A] Piece 2



Technical challenges

Fast passages
High range
Difficult entrances

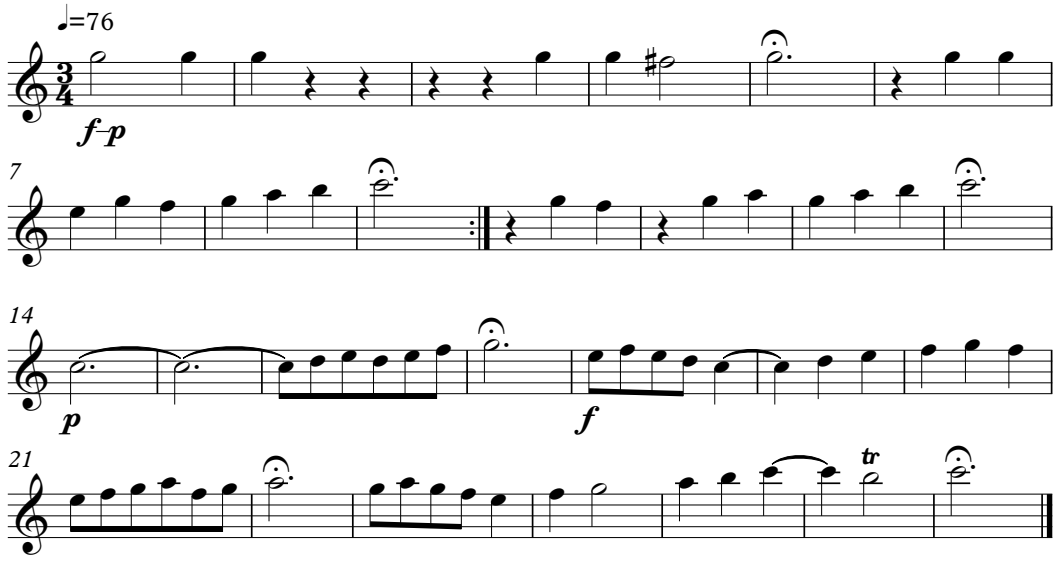
[Group A] Piece 3



Technical challenges

Fast passages
High entrance
High range

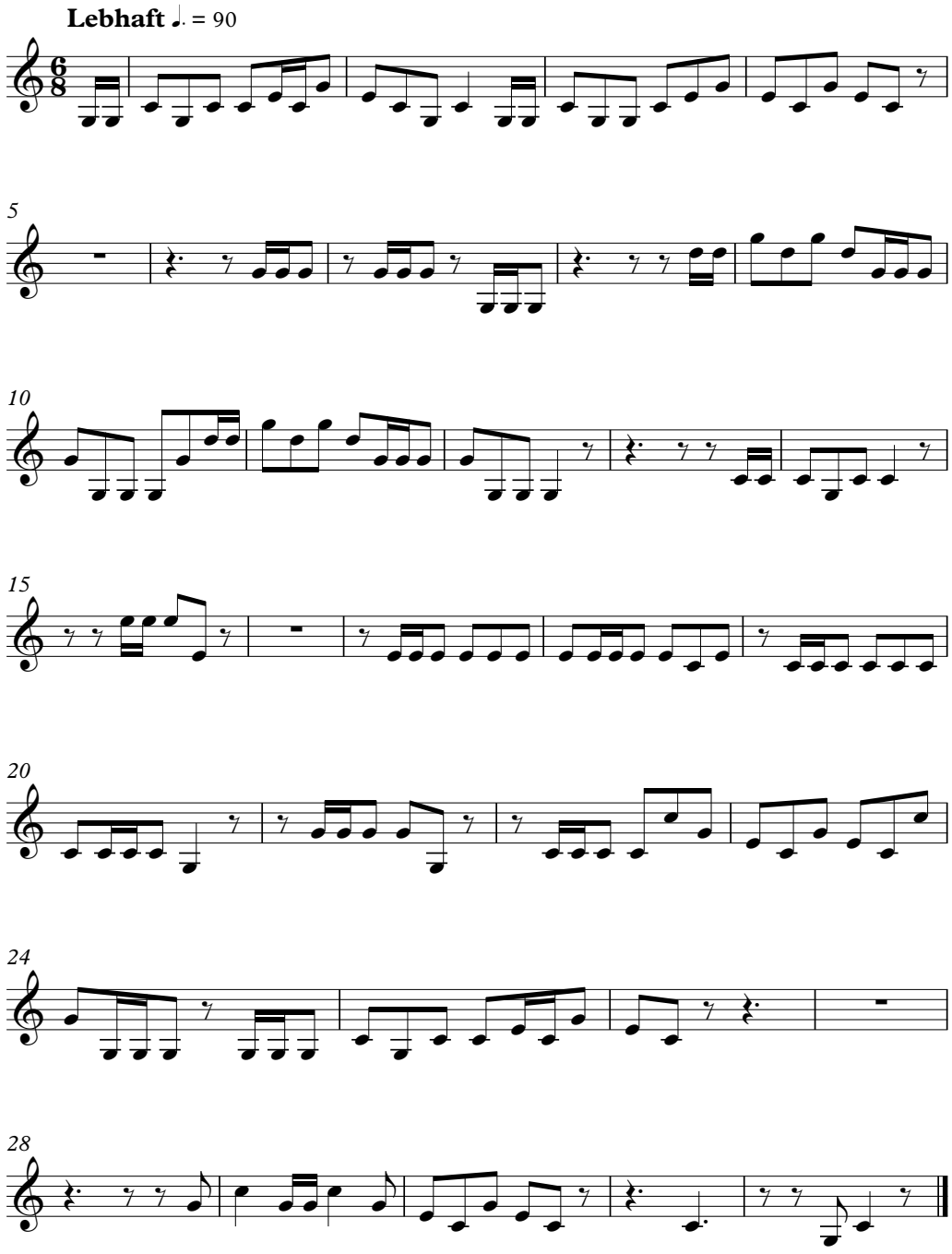
[Group A] Piece 4



Technical challenges

Endurance
High range

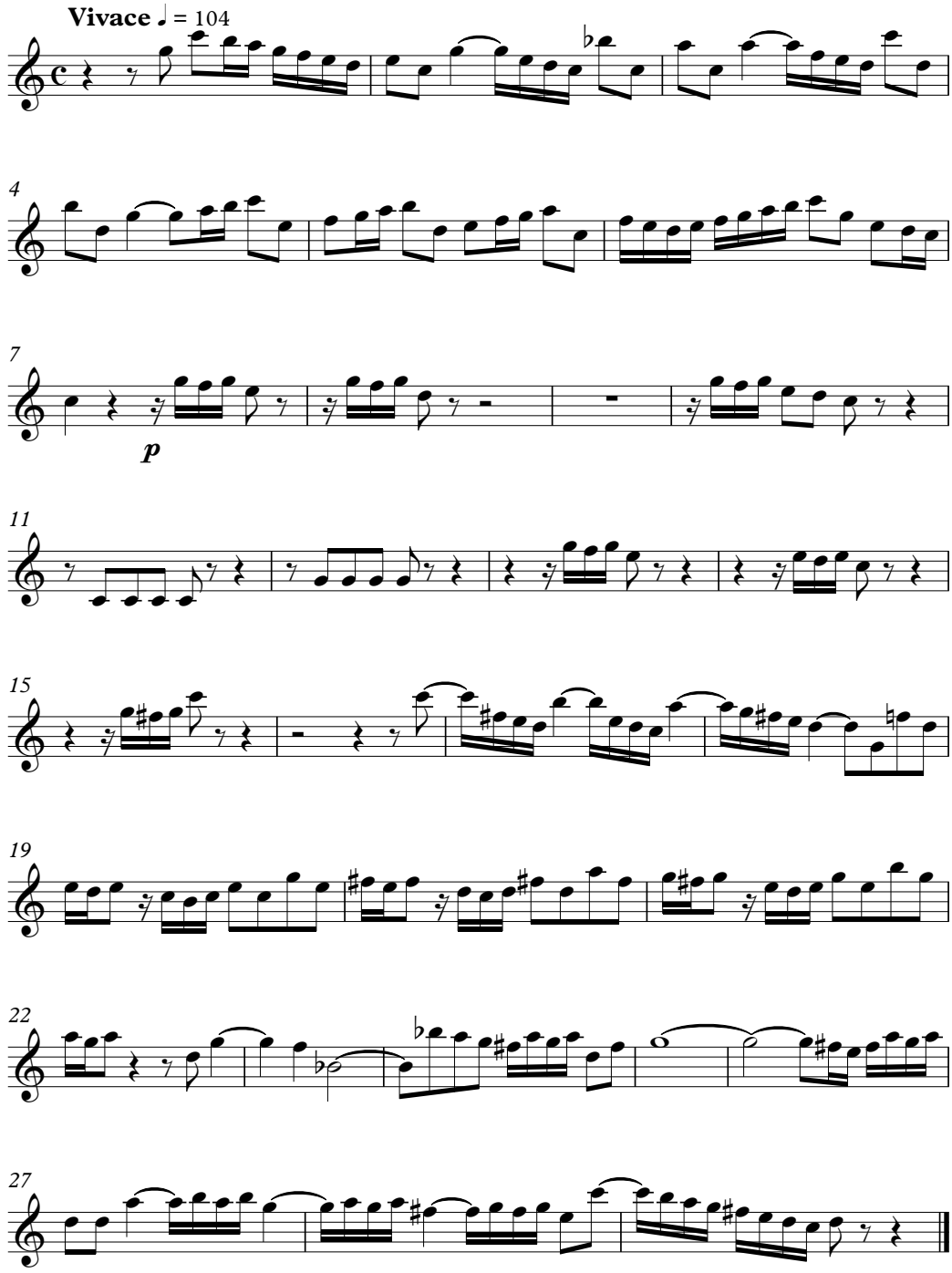
GROUP B
Piece 1



Technical challenges

Difficult intervals
Low range

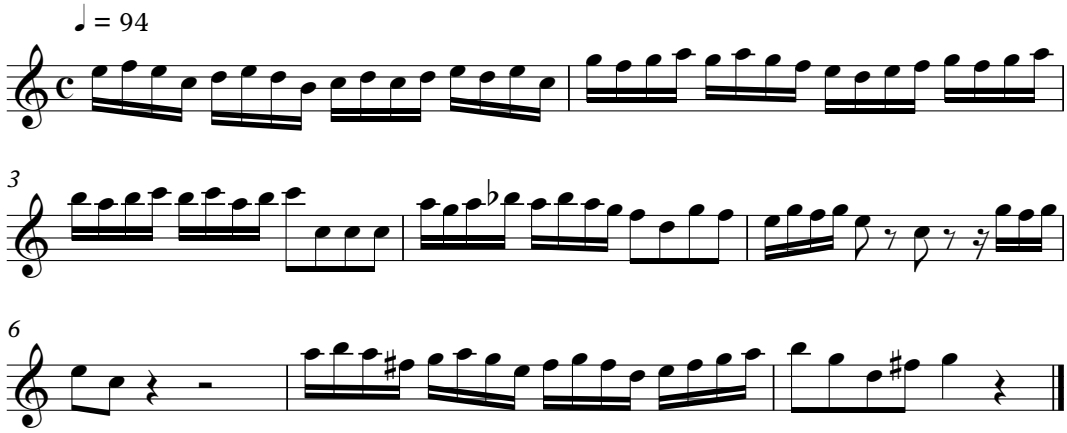
[Group B] Piece 2



Technical challenges

High range
Fast passages
Difficult entrances
Difficult intervals
Endurance

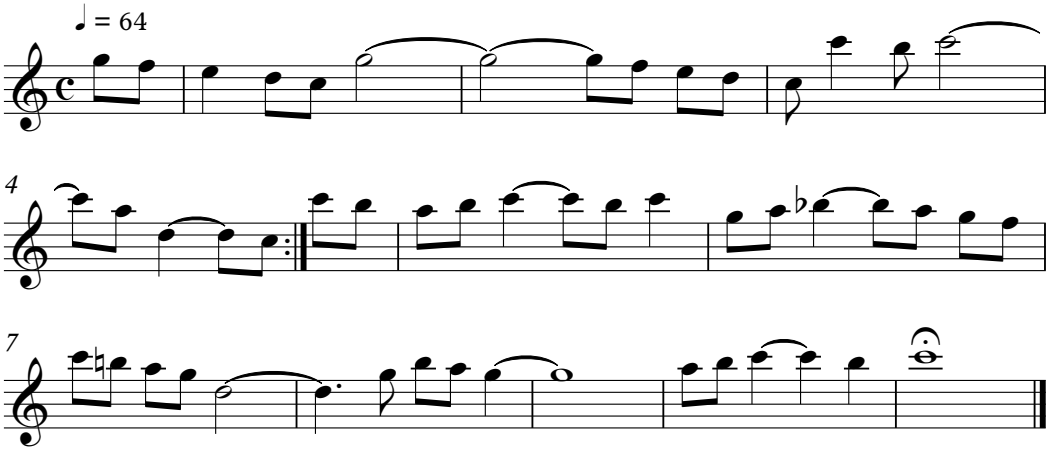
[Group B] Piece 3



Technical challenges

Fast passages
Difficult entrance
High range

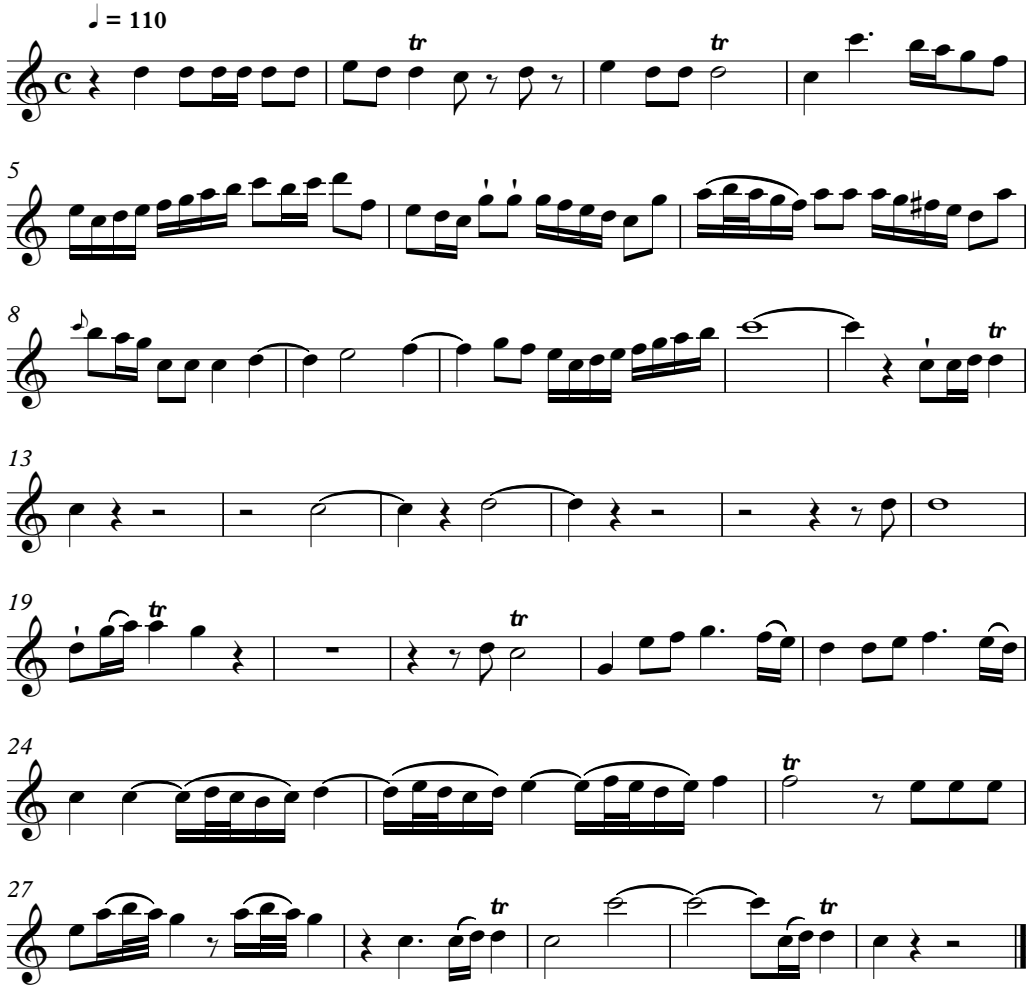
[Group B] Piece 4



Technical challenges

High range
Endurance

Sight-reading Piece



Technical challenges

High range
Endurance
Difficult intervals
Difficult entrances
Fast passages

Appendix B Self-efficacy Scales

Self-efficacy Scale for Musical Learning

Name:

Date:

In 4 days you will perform these pieces, after practicing them for three 5-minute sessions per day for 3 days. Please indicate how much you agree or disagree with each of the following statements, specifically regarding how you would *learn and prepare* for this performance.

	Not at all sure								Completely sure
1. I am confident that I can successfully learn the music for this performance.	1	2	3	4	5	6	7	8	9
2. One of my problems is that I can not get down to practising or rehearsing for this specific performance when I should.	1	2	3	4	5	6	7	8	9
3. If I can't play the music for this performance at first, I will keep practising until I can.	1	2	3	4	5	6	7	8	9
4. When I set important learning goals leading up to this performance, I can rarely achieve them.	1	2	3	4	5	6	7	8	9
5. I can give up preparing for this performance before completing it.	1	2	3	4	5	6	7	8	9
6. When I have something unpleasant to do in preparation for this performance, I can stick to it until I finish it.	1	2	3	4	5	6	7	8	9
7. When I decide to do this performance, I go right to work on the music.	1	2	3	4	5	6	7	8	9
8. When first playing the music for this performance, I soon give up if I am not initially successful.	1	2	3	4	5	6	7	8	9
9. The prospects of failure in this performance can just make me work harder in preparation.	1	2	3	4	5	6	7	8	9
10. I can give up on working towards this performance easily.	1	2	3	4	5	6	7	8	9
11. I am not capable of dealing with most problems that may come up when working towards this performance.	1	2	3	4	5	6	7	8	9

Self-efficacy Scale for Musical Performing

Name:

Date:

You are about to perform these pieces. Please indicate how much you agree or disagree with each of the following statements, specifically regarding *how you will perform during this activity*.

	Not at all sure								Completely sure
1. I am confident that I can give a successful performance.	1	2	3	4	5	6	7	8	9
2. I have set important goals to attain during this performance, but I cannot achieve them.	1	2	3	4	5	6	7	8	9
3. I can avoid difficulties and challenges during the performance itself.	1	2	3	4	5	6	7	8	9
4. If I perceive the events or context surrounding this performance to be too stressful, I cannot even attempt to perform.	1	2	3	4	5	6	7	8	9
5. If something unexpected happens during the performance, I can handle it well.	1	2	3	4	5	6	7	8	9
6. I can avoid this performance if the music looks or sounds too difficult for me.	1	2	3	4	5	6	7	8	9
7. I feel insecure about my playing for this performance.	1	2	3	4	5	6	7	8	9
8. I can give up easily during the performance.	1	2	3	4	5	6	7	8	9
9. I am capable of dealing with problems that might come up during the performance.	1	2	3	4	5	6	7	8	9

Appendix C General Information Questionnaire

General Information

1. Date:
2. Name
3. Age:
4. Male/Female:

5. How many years have you been playing the trumpet?
   ___ years

6. How many years have you been playing the natural trumpet?
   ___ years

7. How many hours do you normally spend practicing natural trumpet in an average week?

Playing:	___ hours
Rehearsing and performing:	___ hours
Reading scores/mental practice:	___ hours
Listening:	___ hours

8. How often do you perform on the natural trumpet
   ___ (average) times per month

9. What would be the maximum hours you spend practicing in a day?
   ___ maximum hours

10. What do you find – physically, mentally/cognitively, emotionally and organizationally challenging about performing on the natural trumpet?

11. Do you play/practice other instruments? (specify) _____

Appendix D Pre-sight-reading/Pre-performance Questionnaire

Pre-sight reading/performance form

Name:

Date:

Time:

	extremely low	extremely high
Condition	_____	
Energy	_____	
Motivation	_____	
Confidence	_____	

Is there anything effecting your ability to play well now?
If so, describe:

Explanation of terms:

- Condition: Embouchure strength
- Energy: Level of physical & energetic feeling
- Motivation: How motivated do you feel to practice?
- Confidence: How confident are you about your ability to play the material?

Appendix E Repertoire Assessment Form

Assessment of piece difficulty

Name: Date: Piece:

Do you know this piece? Well a little not at all

How would you rate the following aspects for this piece?

On a scale:

No problem highly challenging

Technically challenging

_____

Musically challenging

_____

Idiomatic for the trumpet

_____

How do you rate the following specific aspects in difficulty?

Large / awkward intervals

_____

Volume (specify loud, soft or both):

_____

Range (specify high, low or both):

_____

Fast passages

_____

Flexibility required

_____

Endurance

_____

Difficult entrances (which ones?):

_____

Other (specify)

_____

_____

_____

_____

Appendix F Practice Style Assessment Form

Name: Date: Piece:

Practice the piece in your usual way. You have 10 minutes to practice this piece.

What did you focus on during this session?

	never	all the time
Hitting the right notes	_____	
My embouchure	_____	
The sound I am making	_____	
My support	_____	
The musical phrase	_____	
My breathing	_____	
The sound I want to make	_____	
Relaxing my body (where?)	_____	
Avoiding a wrong note(s)	_____	
The airstream	_____	
The expression of the music	_____	
Tongue level	_____	
Being relaxed	_____	
Rhythm	_____	
Intonation	_____	
Fingering	_____	
Unrelated things (specify)	_____	
Certain notes (specify)	_____	
Tonality	_____	
Musical structure	_____	
Tensing certain parts of the body (specify)	_____	
Other (specify)	_____	

Appendix G Logbook Session Sheets

[There were nine session sheets: 3three for each day]

Session sheet Day 1 Session 1

Name:

Date:

Time:

Before practicing

extremely low extremely high

Condition _____

Energy _____

Motivation _____

Confidence _____

Directly afterwards

extremely low extremely high

Condition _____

Energy _____

Motivation _____

Confidence _____

Do you feel like continuing? YES / NO

Comments

What was your level of engagement?

extremely low extremely high

_____

Other relevant comments:

Appendix H Explanation, Guidelines and Rules for Using APT

Guidelines for Using the Audiation Practice Tool [APT]

Instructions for practicing with APT:

Imagine the phrase/motif you are about to play with as much detail and nuance as you can evoke (pitch, tone quality, volume, articulation, transition from one note to another…)

Sing and gesture the phrase/motif dramatically and with detail

Play the phrase

Play **another version(s)** of the phrase

Repeat the procedure with a new phrase/motif

Rules

- Stop if tired, bored or in pain.
- Avoid analysing and judgement – focus on the imagined sound.
- Avoid mechanical repetition.

Practice the pieces:

- Three days
- Three sessions each day
- Each session is 5 minutes
- A minimum of 30 minutes between each session [you can practice other unrelated repertoire in between (Do what you 'usually' would do)
- Comments: mention what you did and what you noticed and felt. Also mention anything that may have relevance to your ability to play. (e.g. if you are sick that day or practiced more or less than usual)

Appendix I Guidelines and Rules for the Practice Sessions

Guidelines and rules

Practice the pieces during the next three days using your usual methods and strategies.

- Three days
- Three sessions each day
- Each session is 5 minutes
- A minimum of 30 minutes between each session [you can practice other unrelated repertoire in between (Do what you 'usually' would do)
- Comments: mention what you did and what you noticed and felt. Also mention anything that may have relevance to your ability to play. (e.g. if you are sick that day or practiced more or less than usual)

Explanation of terms:

- Condition: Embouchure strength
- Energy: Level of physical & energetic feeling
- Motivation: How motivated do you feel to practice?
- Confidence: How confident do you feel about your ability to play/learn the material?
- Engagement: How 'present'/in the moment/interested were you?
- Comments: Anything else that would be relevant to explain your playing ability for that session

Appendix J Post-performance Questionnaires

a. Post-performance Questionnaire Control Phase

Questionnaire: Performance rating & assessment of piece difficulty
(After 9 practice sessions and for each of the 4 pieces)
Name: Date: Piece:

(After performance) How would you rate this performance?
Completely unsatisfied highly satisfied

_____

How would you rate the following aspects for this piece?
No problem highly challenging

Technically challenging

_____

Musically challenging

_____

Idiomatic for the trumpet

_____

Enjoyable

_____

How do you rate the following specific aspects in difficulty?
No problem highly challenging

Large / awkward intervals

_____

Volume (specify loud, soft or both):

_____

Range (specify high, low or both):

_____

Fast passages

_____

Flexibility required

_____

Endurance

_____

Difficult entrances (which ones?):

_____

Other (specify)

_____

Was the amount of practice time enough?
Insufficient more than enough

_____

b. Post-performance Questionnaire APT phase

Questionnaire: Performance rating & assessment of piece difficulty
(After 9 practice sessions and for each of the 4 pieces)

Name: Date: Piece:

(After performance) How would you rate this performance?

Completely unsatisfied highly satisfied

_____

How would you rate the following aspects for this piece?
No problem highly challenging

Technically challenging

_____

Musically challenging

_____

Idiomatic for the trumpet

_____

Enjoyable

_____

How do you rate the following specific aspects in difficulty?
No problem highly challenging

Large / awkward intervals

_____

Volume (specify loud, soft or both):

_____

Range (specify high, low or both):

_____

Fast passages

_____

Flexibility required

_____

Endurance

_____

Difficult entrances (which ones?):

_____

Other (specify)

_____

_____

Was the amount of practice time enough?

Insufficient more than enough

Comments:

1. What did you learn and notice about practicing with APT?

2. How did you feel when practicing this way?

Appendix K Practice Style Data

PRACTICE STYLE DATA	Participant						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Categories							
The body (internal focus) = I							
My embouchure	0	0	0	3,2	0	8,2	2,2
My support	9,7	0	5	2,8	0	0	5
My breathing	7,9	7,8	0	0	0	0	3,4
Relaxing my body	9,8	0	0	0	0	6,2	0
The airstream	2,2	0	6,8	0	0	0	4,4
Tongue level	0	0	0	0	0	7,7	5,1
Being relaxed	8,2	0	0	0	7,4	0	1,2
Fingering	7,2	0	8,8	10	2	5,7	2,2
Tensing certain parts of the body	8,1	0	0	0	0	0	0
Total score for internal focus	**53,1**	**7,8**	**20,6**	**16**	**9,4**	**27,8**	**23,5**
Separate technical or theoretical aspects = T							
The sound I am making	6,7	0	0	7,8	0	6,8	5,2
Rhythm	9,6	10	0	10	9,3	6,8	9,4
Intonation	0	3,8	8,8	5,1	9	0	3,5
Hitting the right notes	3,6	7,7	7,7	10	9,3	7,3	8,8
Avoiding the wrong note	0	0	0	9,9	7,7	0	9,5
Certain notes	6,5	0	7,3	2,8	0	7,3	8,8
Tonality	0	0	0	0	0	7,6	6
Musical structure	0	0	0	0	0	8,2	6,2
*Trills		6,7				6,3	8
Total score for technical focus	**26,4**	**28,2**	**23,8**	**45,6**	**35,3**	**50,3**	**50,4**
The result/desired result (external focus) = E							
The musical phrase	7	0	0	0	0	8,4	3,6
The sound I want to make	3,1	0	0	0	8,2	7,7	3,2
The meaning of the music	0	0	0	0	0	8,2	3,8
* Singing	6,8		10				
Total score for external focus	**16,9**	**0**	**10**	**0**	**8,2**	**24,3**	**10,6**
Unrelated things (distraction or avoidance)		0	0	0	0	0	2,7
Practice profile	**ITE**	**TI**	**TIE**	**TI**	**TIE**	**TIE**	**TIE**

* These aspects were added by one or more participants.

Appendix L Post-APT Phase Questionnaire Answers to "Comments" with Analysis (The analysis below is colour coded)

a) Word analysis

Post APT phase questionnaire answers to "comments"
ANALYSIS

External focus
APT promotes learning
Engaging, enjoyable, comfortable/depends on mood
Trust/Don't trust gesturing
Willingness to continue using it or developing use
Spares the lips
No immediate results

1. What did you learn and notice about practicing with APT?

Participant 1

I was actually actively thinking about articulation or direction in the phrasing and the way I really wanted it to sound. It was not only about trying to hit the note. I think sometimes I could have been a bit more dramatic. It helps a bit to be more extraverted in the playing, I think.

Participant 2

This APT encourages my sound imagination, which helps with learning the music. I did not feel that dramatic gestures help much, which I suspect is due to the body not being trained/developed to do it.

Participant 3

I have strongly noticed that every time you play a certain passage it can sound completely different. There are so many nuances to choose from, so many different characters and nothing will sound twice exactly the same!!! Singing and gesturing is a great way to really get to know what you actually want and get this into your body (internalise). Furthermore the practice sessions were never boring as there was so much diversity (one passage, then another one). I really felt how easy it was to focus and to concentrate and that the practiced passages were more likely to be remembered in the next session. I personally think 5 min 3 times a day would be too short for me. If I could apply this method on my daily practice! (which I will as I really felt a progress in myself and my playing!!!!)

Participant 4

Faster result by playing less. Faster understanding about phrasing/musicality.

Participant 5

The imagine part is always good, and I should be more aware of that.

Participant 6

It is important before practicing to know exactly what I have to do, how, and to work without distractions. To be fit physically and mentally is important with this type of practice. I first need to have a concept and then go into details. [Original: Es ist sehr wichtig vor dem Üben deutlich, genau wissen was muss ich tun, wie will ich es machen, in ruhe arbeiten. Körperlicher und besonders mentale Fitness sind sehr wichtig bei so eine Art der Übens. Erst muss (für mich) die Form (Konzept) gemacht werden, dann die Einzelheiten.]

Participant 7

I get into expressing and audiating.

2. How did you feel when practicing this way?

Participant 1

When I was really engaged it was fun. It also spares the lips, as you don't always put the trumpet on your lips to play the phrase. I often sing my music/phrase while practicing but that added also another dimension by engaging the body (mainly the hands but also other parts).

Participant 2

It felt strange at first, especially with improvising the phrases. However, it felt easy for the brain; it was always active and everything I practise feels fresh even though I am physically tired. I enjoyed this practicing process overall, but was uncomfortable that it did not help with developing endurance and mechanical securities.

Participant 3

It was a lot of fun and very enjoyable! Never boring!! And I have learned to loosen up my body and really letting go in all kind of weird movements!

Participant 4

Depending on the energy level and confidence: When this was high it felt motivating and effective. When this was low it felt silly/ineffective.

Participant 5

In the "sing and gesture" part sometimes a bit strange, but it can be useful sometimes, I think not always in any studie (problems).

Participant 6

It depended on whether there was a positive result. When it worked, I was motivated, when not, I was unmotivated. Directly afterwards, I thought about how I could do it differently next time, what goals I should have. [Original: Je nach dem, ob die Übung erfolgreich war, war ich motiviert oder demotiviert. Ich habe aber direkt danach überlegt, nachgedacht, was kann ich beim nächsten mal anders machen, was werde ich tun, welche Ziele habe ich.]

Participant 7

Its generally fun, but frustrating that 5 minutes is not enough.

Appendix M Practice Instructions for Project Two

Individual Preparation

Please prepare for the 'Macht und Musik' Ensemble project in the following way:

Use the APT tool as before, but with no limit to how long or often you practice.

In addition to practicing your own part, practice at least one other part in each piece – choose one that can give you more context about the piece, or that is interesting for you.

For the next 10 days (27 April-6 May), Please focus on the following:
What the sound, gesture and meaning of each fragment or phrase is, as well as generally for the piece.
Exactly what you want your part to sound like.

Please log in when and how much practice you did on this repertoire (see sheets below). You can do this on your computer and send it to me afterwards.

Many thanks for your participation.

Appendix N Practice Log Sheets for Project Two

Practice Log sheet Macht und Musik repertoire

From 27 April – 6 May
Practice the repertoire only using APT:

Instructions

- Imagine vividly the fragment you are about to play in it's ideal form
- Sing and gesture the fragment with clarity and detail
- Play it in one or more variations
- Practice your part for each piece *plus* at least one other person's part
- Practice as long or often as you want

Name:

Date:

Session time begin:
Session time end:
Pieces practiced:

Comments:
In this area please write how the session went – your observations. How you practiced, what is engaging, challenging, frustrating, boring. What you are experiencing during the session and how you feel.

Date:

Session time begin:
Session time end:
Pieces practiced:

Comments:
In this area please write how the session went – your observations. How you practiced, what is engaging, challenging, frustrating, boring. What you are experiencing during the session and how you feel.

COPY & PASTE THIS PAGE AS OFTEN AS YOU NEED

Appendix O Post-performance Survey Questions for Project Two

Post Performance Survey
Project: 'Macht und Musik' Die Glocke Bremen 10.05.2015

Please answer the following:

1. CONCERT RATING
In comparison with other concerts in which you have played natural trumpet in the last year, how would you rate this one?

Worse than most Average Better than most The best

2. HOW YOU FELT DIRECTLY BEFORE THE CONCERT
a) How would you compare your level of motivation with other concerts you have performed on natural trumpet in the last year?

b) How would you compare your level of confidence with other concerts you have performed on natural trumpet in the last year?

Lower Average Higher than most The highest

3. PERFORMANCE EXPERIENCE
In comparison with other performances you have made on natural trumpet in the last year, how would you rate the following?

- Accuracy
- Nervousness whilst playing
- Ability to play musically
- Enjoyment
- Engagement with the music
- Engagement with the ensemble
- Engagement with the audience

Worse than most Average Better than most The best

4. FOCUS
To what extent did you focus on the following during the performance?

- Making a good sound
- Playing accurately
- Playing together with the group
- How you are using your body
- The meaning of the phrase
- Avoiding mistakes
- The meaning of the piece
- What others are thinking of you/your playing

Less than usual About the same More than usual

Appendix P Transcripts of Post-project Interview for Project Two

(See separate excel sheet for the coding)
Interview questions and rational for each

Q1: *What do you find challenging about performing on the natural trumpet?*

Question 1 was designed to check if the assumptions of the researcher about the difficulties of natural trumpet playing corresponded with the participants' own perceptions.

Q2: *What did you notice in your recent performances (Macht und Musik and performances since then) and how would you prepare for the next ones?*

Question 2 refers to research question 4 ('Using external focus is beneficial to musicians' learning and performance experience'**)**. The answers were analysed using a global coding method.

Q3: *To what extent do you still compare playing natural trumpet with playing modern trumpet whilst you are playing natural trumpet?*

Answers to question 3 revealed to what extent the participant was comfortable with/ 'acclimatised to' playing the natural trumpet as this may affect some of the reactions.

Q4: How often did you practice the concert material in the ten days preceding the concert and did you use APT?

Question 4 was a check to see if the participant actually practiced with APT.

Q5: *What did you learn from this project (Macht und Musik)?*

Question 5 refers to research question 4 and the answers were analysed using a global coding method.

Q6: *Do you continue to use APT in any form now in your practice?*

Question 6 refers to research question 5 (*To what extent did the participants continue to use APT after the experimental phase?)* and the answers were analysed using a global coding method.

Q7: *Before you did these two projects, what was your usual strategy for learning a new piece and how did you prepare concerts?*

Transcripts (See separate excel sheet for the coding)

S= Susan Williams (the researcher)
P1; 2; 3 etc. = Participant 1; 2; 3 etc.

Participant 1. 18.06.2015

Q1. SW: What do you find challenging about performing on the natural trumpet?

Subject 1.: Um, what I find challenging is, I guess is hitting the right note, also, its maybe a wrong way to say it, but just like, playing it musically it makes everything you think goes through the instrument and then you don't think about hitting the right note and then when you think musically it just goes

SW: Is it challenging to be able to do that?

P1: I find, yeah.

SW: So what prevents you from being able to do that?

P1: I think it's not being 100% in, or engaged, it's just like you think "oh I'll play a bit like this, but when you really know or at least try to do what you want and exaggerate it and really be in the music, usually it ends up being easy to tell what you want, usually you get in the music and play the right notes

SW: and be able to know what you want

P1: Yeah.

SW: it's a challenge

P1: maybe, yeah.

SW: and to stay there

P1: To know what you want and to play it or try it.

Q2. SW: So what did you notice in your last performances, so we're talking about the Macht und Musik project and you've done an exam since then. What did you notice about those performances, how it was to play and how would you prepare the next ones? What you've noticed in the last ones.

P1: Well I really did actually the gesture and the singing with the Altenburg quite a lot in the solo and it helped me a lot I think because I saw I was super, ah, engaged with the music and I was actually singing it for my niece and I was exaggerating (laughing)[…] everything but you c really hear every note and just making [ ] like in different ways so she could laugh like and after I was playing, and even when I was playing I went super – when in a melodic section - and I did really something super exaggerate, but then, after , when I played it, I felt like I knew – it was easier and I was – everything was – I could control it and make it musical and nice I think. Um. Yeah, and so I think I actually should go a bit more in this way and try and make more of what I do sometimes in the practice room and exaggerate – even if it's out of style. – and then after, just bring it back to what I think it should sound like. And also maybe, I don't know whether I will do that - I notice that sometimes my concentration goes and that's something I should maybe try to figure out how to … -I notice in the project Macht und Music by the Schmelzer, I was gone, and then I was "Oh shit, like I cannot be gone like this" for the Altenburg and I came back and it was then "okay, lets play" and it's a bit like when I lost it in my exam – towards the Spanish song.

Q3. S.W: Concentration. And so to what extent do you still compare the experience of playing natural trumpet and modern trumpet whilst you're playing the natural trumpet? Are you comparing them any more whilst you're playing, or is it -ah – is it 'normal' on natural trumpet, or do you still compare in some way?

P1: I think I approach it as a different instrument. But I still do compare and I think when I started the baroque trumpet it helped me a lot for my modern [trumpet] and now I think I advanced so much on the baroque, sometimes I think I learnt so much on the baroque I try to do it also on the modern trumpet. So I – it is a bit of a different instrument, but I think I'm not really…

SW: So you're not really frustrated by the fact that you' re not thinking this is less - or harder to play accurate on this than the modern trumpet – you're not aware of that difference anymore?

P1: No

SW: Were you at the beginning?

P1: A bit – yeah. I was actually – like it's hard to hit the right note and maybe to play in tune, although you know, yeah, after a while I guess you get used to it.

Q4. SW: Okay. So back to the ten days before the Macht und Musik project where I asked you to use this tool: how often did you practice that repertoire in the ten days before? Every day, several times a day, less than once a day or not at all?

P1: I did about once a day. I was taking parts, of what I knew that was hard for me, and also I, like you said - I also took another part and I looked what is hard in this part and to practice those part more than I thought would be fine.

SW: Did you use the APT tool each time, or …

P1: Yeah, most of the time I was trying to do it, and sing it and gesture it. Maybe not all the time, but most of the time I was trying to do it.

Q5. SW: And what did you learn from doing this project – what did it bring?

P1: Um, well I guess a lot of things, but you mean also with the tool that you gave us, or just the whole project?

SW: Yeah – because it's a contextual project rather than just playing your part. The tool was in a musical context, but even the concert itself was about what the music means rather than about playing "nice music", if you know what I mean, so what did you experience?

P1: Well I think I learned a lot because we played so many numerous pieces in different settings, also I learned a lot of the different parts, which was interesting – after 'when you know one you know everything' what's going on, so maybe I was more aware of the whole thing, and also practicing with the APT tool it helped me also to – maybe know a bit more what I wanted, when I was playing after. Because I was gesturing it and playing it in another way and also in the week before I practice just in small bits and not playing through the whole piece because I knew I had – at first I didn't have a lot of time, and second, because I thought it was more effective to just look at the pieces I know would needed some more…

SW: And you also played some of the other parts

P1: Yes

SW: even though you didn't have much time, you found the time to do that

P1: Well I made a point to have at least lets say – if I played first I played at least the second, or if I played second, I practiced the first, or… yeah. To see the exchange, or even maybe going between the two, like when they were answering each other I would be like (sings an excerpt) to see a bit like – the exchange

Q6. SW: Do you use the APT tool or aspects of it now in your practice? First of all do you use it as a whole thing – like 'imagine, and then singing and gesturing and then playing variations, and then playing it again? Do you use it now?

P1: I think I've always been using singing – for a long time, since I've started the baroque trumpet actually, but now I think I use it a bit in a different way. I think I should use it a bit more sometimes because I think I just go to my old way of practicing – which was not always effective, but I try to keep using it, yes. Because if I – the way I saw it - playing such an important role, my conception of the Altenburg – I felt – cause after I was just always the same way as I do but I was just making my niece laugh and it was actually every time a different way and after I was like 'Oh actually it's actually what I was supposed to do actually – so I – then I was like, well – I should… I do it sometimes but…

SW: So you do that occasionally as a whole tool.

P1: Yeah

SW: But if you take each aspect of it: 'imagining the musical fragment vividly in its ideal form': do you do that a lot?

P1: I do, but I should do it more I think.

SW: Do you sing a lot?
P1: This I always do

SW: Every practice session, you do some singing?

P1: Yeah

SW: And gesturing? Do you do that?

P1: This I did less, actually. I did less and I should try more.

SW: So you would do that occasionally?

P1: Yeah

SW: And playing variations of the fragment or the phrase? Do you do that very often?

P1: Yeah I do

SW: Every practice session or every day?

P1: most… every day I would say. Maybe not every time. I try to often make it simpler and also more complicated and also change the way I play it.

Q7. SW: Okay. So to finish: Can you describe – before we did the APT tool in this form

… can you describe what your 'usual' way/strategy for improving or learning a new piece used to be? How would you have normally gone about learning a new piece?

S1: Often I would know if I could not hear it or could not sing it, then it would be not useless but would have like you know okay I cannot even hear it so I then cannot really play it. That would also sometimes try to sing it and hear the intervals – that was something that I would try to look. And I would sometimes play slower, and then increase a bit the tempo, which sometimes can work, but not always and um, well I've been also working a lot in the last four years with you – with hearing the intervals and placing like having a few intervals and playing them in random order, so I've applied that a few times also. But often like just the fact that I would hear it and sing it would help quite a lot.

SW: and what was your usual strategy in the past for preparing a concert?

P1: Um…usually I would look at the piece and play it a bit and try to have my own conception and then also listen to it often, and take different ideas from different recordings, then, um, try to not always, um, go through the piece, but, depending on what it is sometimes also like I would, like, prepare a different passage which I knew was harder and then hear the intervals, playing it a bit slower, faster, different ways, and then I would also try before the concert, to run through the whole thing – to feel how it is to play the whole thing.

Q8. SW: Okay. Has this changed since the intervention, since we've been using this very clear tool? Of course certain aspects you've already been introduced to or even had yourself, but since this phase – this intervention that we did – has it brought any new perspective on learning, or performance preparation?

P1: It did change a bit. I think maybe I'm a bit maybe sometimes introverted and I think if I try and practice extra full all those things then after, when I play I can also – although I might not go as far – in maybe a better conceptual way. Yeah and say it and not just play the notes, and try to kind of play the music.

S.W.: Tell me more about when you were practicing in front of your niece.

P1: Last April when I was at my parents' place, the whole family was there including my nephews. When I started practising trumpet or cornetto they would run and come to see and listen. They could sometimes stay quite calm or move to the music for a good 30 min. At first I would do simple melody as a warm up and try to react to them as well.

At one point, I needed to practice specific pieces. When I normally do so, I often sing some passage. I noticed that my niece found it really funny when I was singing some excerpts from the pieces. I would sometimes change the melody a bit but at one point I started to sing the excerpt or the whole pieces but in an extreme way; I would never play like this in real. Sometimes I would sing very lyrical with a bit of vibrato, change of dynamics and rubato/tempo change. I would also move my hands around according to the effect I was singing. I could move my hands slowly in a steady motion when I was singing it lyrical. I did also some mimics with my face especially in more active passage and moving mainly my upper body. I felt a bit like an opera singer or actor trying to exaggerate everything with gesture and music so it could be understood better. It was making her laugh even more! (and it was fun for me too). At the end I guess it was a really efficient practice session as I mastered the movement even better after doing all those things!

Participant 2. 18.06.2015

Q1. SW: I'm coming back to a question I asked at the beginning of this intervention. You've done a few performances recently, with the ensemble and for exams. What do you find challenging about performing on the natural trumpet?

P2: For most of it feels really – the natural trumpet feels really exposed. I am alone mostly–not physically, but sometimes alone in the context, kind of.

SW: and what happens, what can happen from that feeling?

P2: I think so far the worst is that I loose contact with myself, an then of course you can hear it right away on the trumpet. Mostly I can feel it in my right arm – like I don't feel the weight of the trumpet, and I have to support by raising my shoulder – and that's when I know I am out of the … and that happened a few times.

SW: and is that also something that happens in your mind that's connected with that? So physically that's your experience: is there something mentally that – is the idea of being exposed. Is it the idea of being alone?

P2: I think, subconsciously yes, because if I recall my experiences, then I don't actually think about it. I only notice something physically is happening, then I connect it with what I know.

SW: but you just mentioned that feeling exposed is challenging – feeling exposed feels more challenging than on the modern trumpet?

P2: Yeah.

Q2. SW: What did you notice in the last performances and how would you prepare for the next ones?

P2: As of right now, I think I just have to get used to – well it's not really related directly to my playing, but I think I just have to get used to the act of organizing things – organizing things together, because if they are there, then I have one less thing to worry about, and of course when I am actually playing the thing then there is always things to react to and it's easier to play because the harmonies or the sound is there and yeah because by myself I can always practice and practice, but I'm usually practicing out of context. I think I need to practice more in context.

SW: Context and more organization.

Q3. SW: To what extent do you still compare playing natural trumpet with playing modern trumpet whilst you are playing natural trumpet? Do you compare them at all?

P2: No

SW: So they are separate for you?

P2: In a way it's the same. I just play and its um – I just happen to have this in my hand.

SW: So you're not thinking: "this would be easier on modern trumpet?"

P2: While playing, no, but when you recall, you think…

SW: and when you first played natural trumpet, were you more aware of the differences between them?

P2: I'm not sure if aware is the right thing..

SW: Were you frustrated by the differences?

P2: Maybe not – I just know they are different right now. I approach them like: "this is this and that is that".

Q4. SW: So when you did the preparation for the Bremen project, I asked – sent this thing about using this tool for the ten day beforehand – the APT tool. First of all – how often did you practice this repertoire in those ten days? Did you practice it every day? Did you practice it less than every day?

P2: I think less than every day because I can't remember exactly what happened, but I was running from one project to another project, so I didn't really have … it was a really … at first it was a few recordings and then I was mostly running it through my head. Most of the time I think. And also it helped in a way that I played most of them quite some time already, so …

SW: So how many times do you think you actually practice that music in those ten days before?

P2: You mean actually practicing the licks?

SW: Yeah.

P2: I guess I didn't.

SW: You didn't. You didn't use the APT tool doing it? You only imagined them.

P2: Yep.

SW: And you didn't play any of the other parts?

P2: I was just imagining the whole thing and not zooming in on any specific part.

Q5. SW: And what did you learn from doing that particular project? What did you get out of it? What did you notice?

P2: Specifically to my playing, or…?

SW: Yeah – in general.

P2: Nothing that I am really consciously aware of actually, um

SW: Was there anything different about this project than other projects that you've done?

P2: Ah ja, for sure – it was a bit more, in some ways 'open' – maybe open is not the best word to use but we were all open to new, or nothing new, but ideas which helped…

SW: So more exploration than usual?

P2: Yeah.

SW: Rather than just top down

P2: just 'tell you what to do' – yeah

SW: and do you think that's a good thing?

P2: For this group – yes. I think it kind of depends on which group you are dealing with.

Q6. SW: So, the audiation tool: we are talking about that you are vividly imagine the musical phrase or fragment in its ideal form, that you sing and gesture it, and you play it in various ways: do you ever do that now?

P2: Um, it's slowly coming in. I mean for my exam preparation, it's – I think only mostly for the baroque trumpet pieces. I mean my modern trumpet I didn't because I didn't really, I mean I didn't really want to.

SW: Would you say you used the tool as a whole tool: often, or occasionally, or every practice session.. Did you use it as a whole thing? I mean I'll ask you about each part & aspect of it.

P2: Um not too much of the last one –improvise and playing different ways – not too much of that. Sometimes I feel like I need to do it. Otherwise, the singing…

SW: So I'll just go through each one. So as a whole tool, not very often.

P2: Not very often, no.

SW: Imagining the phrase in its ideal form before you play it: how often do you do that –occasionally, every day or every practice session?

P2: Closer to every day. Every day.

SW: And singing it. Do you ever sing?

P2: Closer to occasionally.

SW: Occasionally?
P2: Yeah.

SW: And gesturing? Do you ever try that? Anymore?

P2: Gesturing? Not with the hands. I feel – I don't know – I feel it in this area –like down

SW: The lower part of the body – so you try to move the lower part of the body

P2: yeah

SW: Before you play - or whilst playing?

P2: I think both

SW: So you try to thing of the musical phrase and then you're moving, and then you play the phrase?

P2: Most of the time, I'm trying to connect it to dance or something like that – that's why I feel more at home using this part of the body.

SW: So you try to connect the music to dance.

P2: Yeah.

SW: Okay. And playing variations – you just said you do that only occasionally

P2: Only occasionally. Most of the time – only for ornaments. I like … I try mostly to slow things down or adding things, or…

Q7. SW: So if we go back to before we did all this stuff on audiation: how was your usual strategy for learning a new piece? How did you go about that?

P2: I think before that, most of the – I think I focus on transiting from one note to another note. Because like – I still do think like that in some ways, like ah, each – you have to reach in some way perfection within each note at that moment before you can go on to the next note and I think I focussed a lot more on that before …

SW: The transition from one note to another note?

P2: Yeah.

SW: ...affecting a note and then the transition to the next one and affecting that one.

SW: And preparing a concert: How did you use to prepare concerts? Did you have a way of preparing concerts?

P2: Not really I think it was like, I kind of the way I practice is actually a way of preparing for concerts, so I think like if I get that secure, in a way I know that it will be there. Then I'm not so worried about the actual concert.

Q8. SW: Okay. And has this changed since we did these interventions? So using these audiation methods – has it brought any new perspective on learning or performing or for performance preparation?

P2: Yes. I have to say that the most obvious improvement that I have noticed is when I play things in context with the ensemble, it's like – I feel like at least the gesturing part of the lower part of the body

it really helps me like – especially if I have to lead a certain entrance or something like that. It makes it –I don't know how it feels but it seems like it's almost always clear for them.

SW: It helps you connect with the others?

P2: Yeah. And then they feel it too so I think that's

SW: so do you feel it has something to do with that your physical gesture has something to do with the gesture of the music?
P2: Yep.

Participant 3. 18.06.2015

Q1. SW: So, the first question I asked at the beginning of the whole intervention – I'll ask again: What do you find – because you've done a few performances recently on natural trumpet – what do you find challenging about performing on the natural trumpet?

P3: For me, I think it's still that I have to be so much more focussed on what actual sound I want to have and what the pitch is, because the tuning is different to modern trumpet – it's 415… that I really hear the notes before I actually play them.

SW: And what happens if you don't?

P3: Then the note is wrong. So I trust too often on my muscle remember (memory) still on the natural trumpet, and that is something which I would like to improve, and which is still – ja - a bit difficult.

SW: You trust on your muscle memory but you find it lets you down. – that it's not enough.

P3: At important points, ja.

Q2. SW: So, What did you notice in your last performances and – thinking about the last performances you did –the exams and the Macht und Musik project, and how would you prepare the next ones, considering what you experienced in the last performances?

P3: To go – because this audiation method really worked for me – this dancing and this singing and this, er, playing around with the music so really – do this even more extreme in my practice room and also play for and in front of people and to apply this also to the stage.

Q3. SW: To what extent since you're playing both natural trumpet and modern trumpet … whilst you're playing natural trumpet – to what extent do you compare the experience with the modern trumpet, whilst you're playing the natural trumpet? Do you compare them whilst you're playing, or are you in another zone?

P3: I'm in another zone.

SW: and did you – when you first played natural trumpet – were you aware of this comparison? More= Were you comparing more or were you frustrated

P3: No.

SW: You always saw it as a different thing?

P3: yes

Q4. SW: So now this preparation for the Macht und Music project: (for) the ten days before I asked you to use the practice tool. Did you do that? – in the ten days before. First of all – how often did you practice the repertoire? Did you practice it once a day, less than once a day, not at all or several times a day?

P3: Once a day.

SW: Once a day. So you did it one session a day … and so did you use the APT tool

P3: yep

Q5. SW: So what did you learn from doing this project?

P3: A lot. How to really feel and listen to each other whilst playing. How the instruments connect with each other and also with the timpani and with the lute, and, um, I think a very big thing for me what I've learnt is that playing natural trumpet in this surrounding was so – I felt so comfortable, and so, so, um, confident, that I can really achieve something on this instrument if I keep on working. So that was like an eye-opener… before I was sometimes struggling with "will it work out" and "is it really the right thing to do" and now its this is what I want to bring on the same level like the modern trumpet.

SW: You said "from this surroundings" – what do you mean by that?

P3: Playing in this group from this stage.

Q6. SW: So when you practice now, do you use APT?

P3: Yea.

SW: Do you use it – like the whole tool, with the imagining, the singing and gesturing and playing different versions?

P3: Yea

SW: Do you use it every day?

P3: Yea

SW: Do you use it in every practice session?

P3: Yea

SW: …and if I take the different parts of the tool, like imagining: do you do that a lot – imagining the phrase vividly in its ideal form?

P3: yea – I imagine it. I still have some problems with really hear and imagine the ultimate sound that I really want. But then I start to play around with it and build a story around it and it makes it for me easier to imagine a situation where this line could be (…)

SW: And singing? Do you do that each time? Are you singing more?

P3: Yea.

SW: And gesturing? Do you still do that?
P3: Yea.

SW: You actually enjoy it?

P3: Yea

SW: That's nice… And playing variations. Do you play variations?

P3: I try to – especially when there are big jumps. I try to fill it out, or go in – when it's possible – in thirds up, or try to make some ornaments around it so that I try but this is something

SW: Do you play it in different moods?

P3: Yea! That's what I am doing.

Q7. SW: If you think about before you did this intervention and this way of practicing, what used to be your usual strategy for learning a new piece? – or improving a new piece? What did you used to do?

P3: Repeating. Playing it through… and it was not that interesting and motivating – so I – it was a: I have a new piece, I look at the notes, and I didn't use singing, and I used imagination with the story-telling that I applied, but not in this… - so it was more stubborn.

SW: And what was your strategy for preparing a concert? For a concert coming up – how would you prepare it?

P3: Play the piece at least two times in a row – that I'm able to play – that I know that my brain knows that I can do it. And, um, hoping for the best.

Q8. SW: (Laughs) … and has this changed since the intervention and working on these things? So has using this tool brought new perspective on learning and performance preparation?

P3: Absolutely. Absolutely. So I'm much more focussed on the process than this goal orientation and um I'm very much busy with meditating and trying to find my little bubble, where I do not get the external, er, interference, and it's much more fun, and the results are quicker, and even after, when I, for example when I used it for Heldenleben – that's maybe not an example for baroque trumpet - I used it for Heldenleben, and I practiced it in one session and then the next day – it was still there. You know, I really internalised it and that was such a great thing – to experience that. …and sometimes in the night I have that then the mental practice is still going on, so I feel my fingers are not moving, but I feel the fingers are going through the piece and I hear it and I never had that before. Yea.

Participant 4. 18.06.2015

Q1. SW: So I'm going to ask, once again what you find challenging about performing on the natural trumpet. You've done a few performances recently: the … in various concerts. What do you think is challenging about performing on natural trumpet?

P4: Er, mostly still trusting my solfege and getting actually the right pitch, but also very much, um, really trying to be aware of what the others do while I'm playing, so I, er, become really more like an ensemble member instead of playing my own thing.

SW: And what are the technical difficulties on the natural trumpet for you at this moment? – or physical … what's hard?

P4: Range – although it has improved a lot.

SW: Are you talking about high range or low range?
P4: High range. Ja! And low range – the very low range, yeah. Um… duration…um and, well two months ago still the fingering, but that's improved.

Q2. SW: If you think about the last performances you were in: what did you notice about them and how would you prepare the next ones? Considering how… how did they go for you?

P4: They were really, really great because I know for the first time exactly what I was doing, and also what the other people were doing, um, and I also like the – all the time of the rehearsals – they were really intensive, rehearsing on all those pieces to get a better result than the average concert I actually have. So this I would definitely try to do for next time also and um…

SW: What in particular helps it to be a better result than usual – what would you say is

P4: Well – that I studied other parts. Basically all the parts I played through so I had really an idea of what's going on.

SW: Okay, so you would do that again next time.

P4: Yep.

Q3. SW: To what extent do you compare – when you're playing the natural trumpet, do you compare it still with playing the modern trumpet? To what extent do you compare the experience of playing natural trumpet and modern trumpet whilst you're playing the natural trumpet? Are you thinking of the comparison whist you're playing?

P4: No.

SW: Did you used to?

P4: Yea

SW: So that's become less?

P4: Yea, definitely

SW: Okay. Since when?

P4: Since, I think, February this year. March maybe.

Q4. SW: Okay. So, if we go back to this preparation the ten days before the Macht and Musik project and when I asked you to use the APT tool. So how much or often did you practice the repertoire for this concert in the ten days before? Not at all, less than one a day, once a day or several time a day? In the ten days before.

P4: Um, ja on average definitely each day, but sometimes, like in the beginning when I was feeling very fit – more times a day, like two or three times, and near the actual rehearsals, er, I may have skipped a day, I think. Or once.

SW: you mentioned you were ill, or ..

P4: Yea just before our week in Bremen, I wasn't feeling that well.

SW: And did you use this audiation tool? Did you use it not at all when you were practicing it, each time, less than once a day, did you use it each time or sometimes or every time?

P4: I did use it quite a lot; not always as excessive, like maybe I was sometimes just singing in my head what I wanted to do and what the alternatives were and other places really making the gestures and singing but this, yeah – both of these things I did quite frequently.

SW: So every day did you do that or

P4: Yes

Q5. SW: What did you learn from doing this project?

P4: The amazing range of possibilities you have, and

SW: have for what?

P4: for playing a specific phrase that you not just use the first idea that comes in your head, but explore the others and maybe see what's best. And also – really how to prepare for a concert … for a higher quality than I'm used to.

Q6. SW: So, if we think of the APT tool, which is imagining and then singing and gesturing and then playing in another way – do you use this tool or aspects of it in your practice now?

P4: Yep.

SW: First of all do you use the whole tool – like these aspects? All one after another when exploring a phrase or a fragment? Do you use the whole tool sometimes?

P4: Um, when I really first start a piece then in the first ten minutes I'm trying to figure out what the notes are, how it feels, and then, when I have a bit clear what I need to do technically, then I start to use the APT tool.

SW: So would you say you use it occasionally, or every day or in every practice session? When you use the whole tool.

P4: It depends a bit where I am I the phase of rehearsing the piece. When I'm still struggling with learning the fingering, for example, then I guess I don't do it at all, or very rarely. But when I know the notes and really try to focus about the music, then I'll do it always.

SW: So you will use it with each piece at some stage.

P4: Yes.

SW: And so if we break it up into different aspects – into just imagining the musical fragment or phrase vividly in its ideal form – that part of the tool: do you use that a lot?

P4: Yeah

SW: Singing?

P4: Yeah, also

SW: Would you say every day, occasionally or each practice session?
P4: Yeah, every time I'm practicing.

SW: Also the imagining, do you do that as much?
P4: Yeah

SW: And gesturing. How often do you do that?

P4: I would say maybe less, but still, every practice session.

SW: And playing a variation of the fragment or the phrase? Do you do that very often?

P4: Yeah, definitely in each piece, but not for all the phrases.

Q7. SW: Yeah, so then to finish: before we did this intervention, what was your… if you could just describe your usual strategy for improving or learning a new piece. What did you used to do to learn a new piece or to improve something?

P4: I usually, even though I knew it was not really effective – I just played the whole piece through, and through, and through, and through. Then also I never prepared so well that I felt confident on stage. And Bremen was maybe the first time that I actually felt quite confident.

SW: Okay, So your strategy for improving or learning a new piece was to play it over. Your strategy for preparing a concert – was it any different? How did you prepare a concert?

P4: Yeah, the same way.

SW: SO you played the pieces through a few times…

P4: - even though I always took, I guess um…. I never really pushed myself hard to really get the phrase that was always going wrong really right, and just sort of beforehand accept that okay that will also go wrong in the concert, so …

Q8. SW: And this is a little bit the same question as beforehand but to sum up: so is this usual – how you used to prepare changed since we did this intervention? So, has using APT brought and new perspective on learning and performance preparation? Could you describe it? If it has, what?

P4: Yeah, ah…

SW: you've said some things already, but just once again this question.

P4: Well yes, it has definitely changed a lot because how I use this tool, and I really try to understand the musical phrase and really want to get it right, if it's only because of the tool I don't know, because in the lessons we do it quite a lot in this way I think, so I think also.

SW: When you say 'to get it right' how do you know it's right?

P4: Well that I'm for feeling for myself very clearly that I've, er, looking after a 'research' of these few notes, that I feel confident enough to say them on stage. And before that, I was just really like playing music without making any contact with the audience, or just, how to explain … I didn't believe in it, so to say.

Participant 5. 18.06.2015

Q1. SW: I'm asking you a question that I asked right at the beginning, but since you've been playing a few different performances, again: What do you find challenging about performing on the natural trumpet?

P5: (laughs) Ahhh … to make a proper work, to make a good sound, good intonation, to make good intervals, er,

Q2. SW: So what did you notice in your last performances, and what/ how does it make you think to prepare for future ones?

P5: Concentration. Because you have to really be there with the concentration, otherwise you get lost and you loose the contact with the instrument. So focus – I think that's for me a big point. To be aware.

SW: and what do you need to focus on? What in your opinion? Where does your focus need to be?

P5: Sound, and the next note – the next phrase – so that you know what's coming, because otherwise you … because you don't have, um, a hold on your instrument. It's just your muscles so when you lose your concentration and focus, then you lose where you are – with your embouchure – for the next note.

Q3. SW: And to what extent do you compare the experience of playing natural trumpet to how it is to play the modern trumpet whilst you're playing the natural trumpet? Are you any more aware of the difference? Are you still comparing, or are you not comparing anymore?

P5: No.

SW: You don't anymore:

P5: No.

SW: at first did you – when you first played it did you notice any difference?

P5: It looks like on modern trumpet you are, have more securities on the instrument but you don't have on the natural trumpet.

SW: But you're not thinking about that anymore – comparing it

P5: No.

Q4. SW: And now for the preparation for this Macht and Musik project using the APT tool. So this was: imagining vividly the phrase, singing and gesturing the phrase and then playing different variations of the phrase and also plying other people's parts. Did you – in the ten days before the concert, did you practice this repertoire not at all, once a day, less than once a day or several times a day?
P5: Er… almost every day.

SW: Almost every day.

P5: Yeah.

SW: More than once a day?
P5: No.

SW: So about once a day. And did you use this APT tool when you did that?

P5: Yes, not all, but, yeah.

SW: - every time, each session, or less than each session?

P5: when it's not every session then it's less than one.

SW: So did you use it in each session?

P5: No.

SW: So you didn't play every day this tool?
P5: No

SW: since you only played one session a day.

P5: Yes. And that has to do with time. Sometimes I had not time to do that.

SW: So you thought it would save time to just play rather than do the gesturing and singing?
P5: Yeah.

Q5. SW: What did you learn from doing this project – so this project in general: how we prepared for it, what we did, how it went … what did you learn about that/ from that?

P5: In what way… do you mean?

SW: Was it different in any way than preparing other projects … for you?

P5: Not my own preparation, but the preparation in Bremen, it was different because you were a few days together with the whole group, and actually more time to rehearse than normally we do for a concert.

Q6. SW: So going back to the APT tool – do you use this tool or aspects of it in your practice now?

P5: Yeah.

SW: DO you use the whole tool: like in this order or do you use particular … do you use the whole tool at all, or occasionally, every day or every practice session? The whole tool.

P5: I think almost every practice hours I use it. Yeah.

SW: and so I'll break it into the parts: Imagining vividly of the fragment in its ideal form – do you do that occasionally, every day or all the time?

P5: All the time.

SW: Singing the fragment or the phrase – how often do you do that?

P5: Ah sometimes.

SW: Occasionally?

P5: Yeah.

SW: not every day?

P5: No

SW: You don't sing every day. And gesturing the fragment or the phrase – do you do that?
P5: I use it, but also not always.

SW: Occasionally

P5: Yeah.

SW: Playing a variation of the fragment or the phrase: do you do that very often?

P5: Not that often.

SW: Occasionally.

Q7. SW: Okay, just to finish, um, could you describe – so before this intervention where we were talking about the gesturing and the singing and this way of thinking – what was your usual strategy for improving or learning a new piece – before we did this kind of thing? How did you normally learn a new piece? …or improving a piece?

P5: I'd play it through, then take bits out of it. Play it slowly, um, sometimes singing, sometimes gesturing, but not um,

SW: So you used to do this yourself?

P5: Yeah, but not that much that I do now. I would be (am) more aware of it.

SW: And how did you use to prepare a concert/performance?

P5: In what way?

SW: Yeah, not just practicing pieces, but what did you do to actually prepare a performance?

P5: Also mentally and er, do balance between practicing and rest, so not to overdo things. Yeah, find balance – that's very important I think. Focus. Concentration.

SW: So there are things you were already very aware of

P5: Yeah. And also when I practice, in the last stage, I imagine that I'm already in a concert and at the concert I try to get a feeling that I'm in a practice room, and be with the other musicians – so just be in the music and not feeling "Oh I have to perform and I have to um – how do you say it – that you have to do a – er – just play music not

SW: Just get it right

P5: Yeah, not like a judge, not that you are for the courts or something, but you just enjoy the music.

SW: So you've been aware of that for some time – approaching things like that.

P5: Yeah.

Q8. SW: So has anything of this/your – how you've approached things changed since doing this intervention, which is focussing on the external focus and on the music and gesture of the music: so has using this tool brought any new perspective on learning or preparing a performance?

P5: Yeah, I use it more than before, and I knew that it helped, but er, I found out that it - I have to do it more because I really feel that it helps me more.

SW: And how do you notice that?

P5: That sometimes you have, er, in a shorter time, you get more results.

Participant 6. 09.07.2015

Q1. SW: What I asked, right at the beginning of the study – I'll ask it again. What do you find challenging about performing on natural trumpet?

P6: Er, to be confidant ... to be sure, to be relaxed, to be concentrated, and to have fun.

SW: and what kinds of things are difficult when playing in a concert, or what kinds of music are difficult?
P6: To be relaxed. To be confident and relaxed. And concentrated. In the mean (same?) time.

Q2. SW: What did you notice in the last performances that you did, and how would you prepare the next ones? It's about how you prepare concerts. What did you notice, also in the Macht und Musik concert and the ones that you've done in the last months, and what have you/how would you prepare the next concerts?

P6: The most important thing for me, is not to play through before the concert – just to make random practice. It makes, ah, think much more exactly and sicherer.

SW: And before, you used to just play through the music – is that what you are saying?

P6: Yeah.

Q3. SW: You play both modern and natural trumpet. So do you compare, when you are playing natural trumpet – to what extent do you compare the experience of playing natural trumpet to playing modern trumpet when you are playing natural trumpet? Do you ever think about 'this is different form the modern trumpet'?

P6: I don't make a difference between the two instruments. Actually. But after modern trumpet it's quite difficult to … to get this length of the instrument.

SW: So you notice that.

P6: Yeah.

SW: And when you first played natural trumpet, was that more? Was that more obvious that they are different?

P6: No. Actually not.

SW: okay.

Q4. SW: Now going back to the project, if you remember – the Macht und Musik project. You were using, I asked you to use this APT tool to prepare the pieces. How much – this was the ten days before, I said use this tool – how much or often did you practice the repertoire at all in those ten days? Not at all, less than once a day, once a day several times a day?

P6: Ah, it was different just because I've got also another concert in the period. Er, I believe that it were two days or three days er when I used to practice two times a day.

SW: and the other days?
P6: The other days, once. And sometimes I didn't practice the repertoire at all, just because I am on the road.

SW: Okay, how many days did you not practice it at all?

P6: I don't know – it was May.

Q5. SW: SO what did you learn – doing this project … what did you learn from doing this project?

P6: Mm. Difficult to say.

SW. What was different about this project from other similar projects?

P6: It were really long days!

SW: … the way we did it

P6: Yeah, ah, it was a really good way. We used time. It was good planned. It was good planned. Difficult is to change – we've got two concerts, and acoustic was totally different and actually it was quite short time to prepare – to prepare this project with so many people – different people. It was difficult to get the same sound, and ah, to be a group.

SW: And to what extent did that work? Did it feel like a group in the end?

P6: Yeah. By last concert, yes. Not always, but most of the time.

Q6. SW: Okay, so when you think about this APT tool that you've been using – imagining, singing, gesturing, playing variations: do you use it in your practice now? As a whole thing?

P6: No. As a whole thing, no.

SW: Okay. Do you use – I'll list the different aspects. Imagining the fragment vividly before you play it.

P6: Yes.

SW: Do you use that occasionally, every day or every practice session?
P6: Ah, when I have difficulties. When I miss the note or have some difficult stuff – I play it, I sing it – I sing it before …

SW: No I'm talking about imagining first.

P6: Imagining, okay.

SW: Do you use this imagining every practice session? Or every day or..

P6: No - to be honest, not.

SW: Occasionally?

P6: Occasionally

SW: Singing the fragment? Do you do that occasionally, every day, or every practice
P6: Every day, and actually every practice session.

SW: Gesturing – do you every use your body to gesture a fragment?

P6: Sometimes, not always.

SW: So, occasionally

P6: Occasionally

SW: And playing a variation of the fragment or the phrase – do you ever do that?
P6: Er, Not so often

SW: Never, or occasionally

P6: Yeah. Occasionally

Q7. SW: Can you describe - before we did all of this … interventions – what was your usual way of improving a piece? Before all of this – what did you used to do?

P6: To play again, again, again and again. Sometimes using your advices (laughs) … but actually there… Deutsche calls that 'Verhaltungsmuster'.

SW: Okay, that was your Verhaltungsmuster. And how did you used to prepare a concert?

P6: Ja, for the concert I actually – I start a piece, and for the concert, I try to play it through once a day, just to get endurance, to get idea of pace, but now I realise that that doesn't work always.

Q8. SW: Okay, so that's my last question: How has this changed since the intervention and has using these kinds of ideas – this APT tool – has it brought you any new perspective? On learning, on performance, and what? What new perspectives.

P6: Um, it makes not so much, er, 'Sinn'

SW: Makes not so much sense?

P6: Yeah. It makes not so much sense to play it through – just because, er, before the concert actually you already know the piece. You can play it. But, um, sometimes, er, there is small accidents which are difficult and which, they don't allow you to play this good, and you will be – suddenly you will be stressed, and when you play it, er, as random practice, small things – you are sure and you are just, yeah, you don't think about that. You are thinking about that, but you are not concentrated on this small stuff.

SW: And was does this experience of singing and gesturing and getting/playing the variations, what can that bring? Not that it's just random, but that you are actually doing these things. What does that bring to a fragment or a phrase?

P6: Ja, motorische Wahrnehmung. Muscles. So you are, in the meantime your body recalling this information just because … mein Empfindung.

Participant 7. 25.06.2015

Q1. SW: So first I'm going to ask something that I asked before, but I'm asking it to see what you think about this question now: what do you find challenging about performing on the natural trumpet?

P7: It's very on the edge always. So anything you're feeling – if you're feeling worse, than usual or … so it all reflects on the performance itself. SO basically it's a very high instrument – you are high all the time. You play high all the time, and, yeah, so any deviation from normal you feel it, I think. Yeah.

S: Thank you.

Q2. SW: What did you notice, in your last performances – so we are talking about the ensemble project in Bremen (Macht und Musik) and performances you've done since then on natural trumpet? What did you notice about those performances and how would you prepare the next ones?

P7: In general, or …

SW: In general.

P7: I think I'm generally more concentrated than generally before, so it's easier to concentrate on the ensemble or the music … itself, if it's an orchestral piece, and, yeah, I would use a lot more - actually both techniques: so one direction is the strengthening of the trumpet part, by disassembling it and doing a lot of weird things you don't normally do like, ah, variation or, I don't know like when I practice I move sometimes with the instrument, so it's not comfortable, its not fixed, and stuff like that. And in the terms of music, well, imagining the music with you, imagining you're really in the orchestra, knowing what's coming. I mean it sounds like basic, but it's not. I don't think everyone does it always. So.

SW: And you yourself – you are doing it more than you used to.

P7: I'm doing it definitely more than I used to. And but I also think I could do it even more.

SW: Can you explain one again what you mean? DO what even more?

P7: So – do both. So first learn specifically my part better, by doing/playing, by improvising on it, by playing with it, by making it less comfortable than it is. And less used – that I'm not used to it, in one form. SO varying rhythm or where I am playing – acoustic. Some day I am in a good room, some day I am in a bad room and you don't know what the acoustic is going to be. And the other art is to sort of incorporate it into the musical texture – so if it's an orchestral ensemble piece, then – if its ensemble piece it's even easier, because you/I play through the other parts, then I know what's happening. At

every moment I know how am I in relation to the other players. If it's orchestral piece, then with the partitur, or something that I really know when I'm playing, what it stands for and

SW: … and a piece where it's trumpet and other instruments, like a kind of solo piece with other… how would you?

P7: For me it's the same. I always pretend I'm in the ensemble: I really don't function well when I think I'm playing and somebody's accompanying me.

SW: So you are aware of the other parts.

P7: Yes. So I'm part of something.

SW: Even if it's not trumpet parts.

P7: Yeah, yeah. Even cembalo – it doesn't matter. I just think that we are one thing, and I am just a part of it.

Q3. SW: To what extent you still compare the experience of playing natural trumpet and modern trumpet whilst you are playing natural trumpet? Are you aware of the difference anymore, or do you play them as separate instruments?

P7: I don't compare at all. I see them as different instruments. However, I compare – I would apply some things I do on natural trumpet to the modern trumpet. But not …

SW: And did you used to, when you first played natural trumpet? Were you very aware of the difference? Or bothered by the difference at first?

P7: ah, I think I sort of, from the beginning I saw natural trumpet with more in direction horn or something, so I felt it was a different instrument, but I was very aware of that. I mean in the beginning especially than now. In the beginning I could not combine very well – modern and baroque, and switching around was for me really problematic.

Q4. SW: So, getting to the preparation for the Macht und Musik project in Bremen: Did you prepare for it using the APT tool?
P7: Yes I did actually. All the preparation I did was more APT tool than just

SW: And did you prepare, did you practice it once a day, less than once a day, several times a day or not at all?

P7: I played it/I practiced it every time I did practice.

SW: But how often did you practice then – in the ten days before
P7: In the ten days I did not practice regularly, because I had my modern trumpet exam and I was sick. So if I divide like ten days maybe … if I press it together then maybe I don't know … four days or something.

SW: So you practiced it about four times, four days.

P7: Not four times, but four days. Yeah, I think if I combine it – it was strange over this period, because in the beginning I practiced, and then in the middle I didn't play any trumpet at all, and then closer to the end I played again.

Q5. SW: Okay. And what did you learn from doing this project? Just anything.

P7: Hmm. I think that it was really clear that using such tools, or even seeing the music as more of eight trumpet parts – when its done by everyone who's playing – it makes a huge difference. So I think everyone was going beyond, um, playing normal notes. Sort of. So in the end we, I think we did have mostly common idea – not only about how it should sound like musically, purely, but like what it is for, what is the music about, what does it stand for.

SW: And how would you describe the group experience? How was it to work in that particular group – was that something you normally experience or was it different in some way?

P7: I think it was different – with so many trumpeters. It was totally engaging – for everyone. For me at least, but I think for everyone it was more like, about the music than normally.

Q6. SW: Do you use this tool – APT tool – or aspects of it in your practice now?

P7: I do.

SW: Do you ever use the whole tool – like the imagining, and then the singing and gesturing and then playing variations? Do you, er, do you use the whole tool … at all?

P7: I do. I would use it in a more, but I think on average I do use it every day.

SW: Every day.

P7: or every time I practice at least.

SW: Every practice session – at some time in the practice session?

P7: Yes.

SW: Um, so if I take just parts of this tool: how much would you say you use 'imagining the musical fragment that you are about to play, vividly in its ideal form'? Are you aware of doing that?

P7: Mmm … I am, but I think in the moment I'm doing more things with singing and hands than this, but I always – well not always – but what I often try to imagine is the beginning of the phrase before I play.

SW: And singing the fragment and phrase – that you do … more. You do this each practice session, or every day?

P7: Yes

SW: Each practice session

P7: Yes.

SW: Same for gesturing?

P7: Yes

SW: And playing variations?

P7: Yes

SW: Every practice session?

P7: Sometimes when I'm very tired mentally, then I sometimes just play through stuff – but that's rarely. So normally I do all of this every practice session.

Q7. SW: Can you describe your usual strategy/practice strategy before we did this kind of intervention? How you used to, er, improve or learn a new piece. What did you do before?

P7: Mm… I did sing, but I think I did – I sang more to get acquainted with the text. And I did play through: I think I did some variations but maybe only with rhythm or some like that. Maybe selecting the (?) or main note in each group, but that would be about that. And then play through, play fragments through, getting fragments together, yeah.

SW: And what was your … how did you used to prepare a concert?

P7: Well, in the beginning I used to just prepare pieces and closer to the concert, play everything through, every day, and then work on bits that didn't work. Pretty much.

Q8. SW: Has – what you just described about how you learnt a piece and prepared a concert – has it changed since doing this intervention – since doing/since using this tool … meaning has APT brought any ne perspective on learning or performance preparation?

P7: I think it's become more 'more dimensional'. Definitely, and I also recognise that at a certain point, ah, it's more important for me, at least, the gesture or the content of the music is more important than just, ah, playing the passage. Couse there is physical thing to meet, but, yeah – just playing through does not bring much new. I think when you keep repeating things, at some point the resource of that is over and all those tools – they give much more – much deeper – dimension to that.

SW: Can you describe what you mean by deeper dimension?

P7: Well, it's not just playing the notes. It goes deeper and as I said with variations, it also includes the gesture or singing with gesture or imagining the music, or anything like that. It's also variation.

SW: And how does that result in your ability to actually play?
P7: Then I'm much more comfortable when it comes back to the real thing, I think, because in this way I've done it in many, many, ways and different settings something that's not comfortable and that's different from the original thing, then you explore it in all those ways, and then the thing itself is easier.

SW: It's easier – it feels more comfortable.

P7: Yeah, because you've done/because I've done all the possible – well not all the possible – many possible variations.

SW: Does it bring security?

P7: Yes

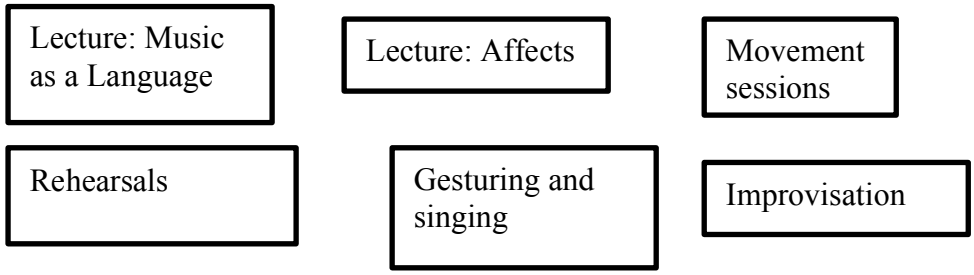
Appendix Q Coding for the Post-project Interview

See separate excel file document.

Appendix R Post-project Questionnaire for Project Three

Comments/Insights/reflections
On the Biber Immersion Project

Tick the sessions you attended:



What was striking/touching/memorable?
What did I notice?
How is this project different to other KC projects I have participated in?

What did I learn & what will I take with me after the project?

Suggestions that may help a project like this work more effectively:

After the concert:

How did I experience this concert?
… and how did this experience differ from other similar chamber music concerts I have played recently (in the last 6 months or so).

Appendix S Transcripts of the Answers to the Post-project Three Questionnaire

Participant Feedback: Biber Immersion Project
8 Students (out of 15)

What was striking/touching/memorable about this project?
What did I notice, and how was this project different from other KC projects?

Student 1
The approach to understand the music by experimenting (with) different fields as movement, improvisation and going deeply into theoretical understanding of the music with the presentation by Florencia.

Student 2
For me was an incredible changing of mind, something that involved you from every kind and point of view. The movement class was particularly amazing and I think should be necessary to be aware of how much important is the balance of our body, because only with this kind of wealth and sensitivity we can create a better connection between body and mind.

Student 3
The rehearsal approach was the musical aspect, most different from other KC projects. The use of gestures and singing was great to try, and certainly opened up clearer and new musical ideas to us

Student 4 (Student 4 only attended rehearsals and concert)
The atmosphere during the rehearsals, quite relaxed but efficient. We could feel that it wasn't a project led by the school. Maybe because of the ration (amount of time) of the teachers, which we don't have always necessarily.

Student 5
I really like how the rehearsals were conducted, it was focussed more on the swing and musical gestures of the group, and I felt it helped us to play together quicker than working on intonation or timing. The movement sessions helped to let go of some stress.

Student 6
Striking: how working through gesturing made such a difference to the sound and interaction amongst the musicians.
Memorable: the music (so beautiful), the movement sessions, the improvisation sessions. The general atmosphere – it was very enjoyable, to be in the process.

Student 7
I enjoyed that the focus was less on 'fixing' things into an acceptable performance/eliminating mistakes. The music had a chance to grow more organically

Student 8
1) *The connection between movement sessions and the immediate result in our playing.*
2) *It was an amazing concert because the connection between musicians was higher than usual.*
3) *It was fantastic to play next to Rachael and Susan. Bring professionals and students together is an excellent way of learning.*

What did I learn & what will I take with me after the project?

Student 1
I have learnt that music can be translated to many things; physical feeling is one of them, and it make (me) feel very secure to have a sound in my head and also a physical sensation before playing

Student 2
I'm sure that I've learnt so much from this project – above all about relaxing during rehearsals and performances and be (as) much natural as possible – that means to be with body, mind and soul, in what you are playing. So this project has taught me how to govern my feelings and how to not waste them in a negative way, but using them in order to communicate.

Student 3
Aside from the above mentioned rehearsal techniques, the movement classes were great for connecting with the body, and thinking about interacting with others in a new and personal way.

Student 4 (Student 4 only attended rehearsals and concert)
For me, the main discovery was this music that I didn't have the chance to perform before.

Student 5
I learnt some rehearsal techniques, which I will definitely introduce into my future practice. Also the ideas on affects opened up more rhetoric possibilities and I am interested to read up on them further.

Student 6
I learned how important it is to listen and being in the process, bar by bar, note by note. The intention behind/in the music, and how to bring them out. Gesturing.

Student 7
The gesturing and singing worked much better than I would have thought, and I will try to use this in my own playing

Student 8
It was a very beautiful experience – the way of listening, very attentive, the inner contact (also learnt in the movement lessons), and the leading – working together: these are the things I'll take mainly.

After the concert: How did I experience this concert and how did this experience differ from other chamber music concerts I have played in recently?

Student 1
I have enjoyed the concert. It was for me a very real experience. Everything we did, I felt it in a very strong way. The difference with other concerts is that, for the first time, I was focussed on connecting with people, ensemble and audience, rather than creating something or thinking about technical things. I really felt music as a communication tool, as a language.

Student 2
At the beginning of the concert, I was a little bit scared because it was the last 'chance' to do my best after such a huge rehearsal schedule, but after about ten minutes I realised that the most important thing was to enjoy the playing together as well as possible and to give something special to the audience, and actually was a very pleasant concert

This experience was definitely different from other chamber music concerts: one, because we were focussed on the feeling to play with a lot of people by using all our energy and synchronise them, without too much thinking but simply feel it in the most primordial way, for example through images.

Student 3
The concert went surprisingly well to me, especially considering many scary moments in the dress rehearsal. The energy was inspiring, and it was clear everyone was very focussed and had clear ideas about the music.

I think the musicians had a deep understanding of the musical affects, and were committed to playing with more physical movement and gesture than usual.

Student 4 (Student 4 only attended rehearsals and concert)
I felt a good energy amongst the players. A real desire to play together.

Student 5
I enjoyed the flow of the concert and the programme. I was aware of everything, including the sense of space in the church.

The sense of 'togetherness' is stronger than recent music concerts. There was a distinct group identity.

Student 6
The concert was pure joy for me. I could enjoy a lot because I felt it was not about a result but about the whole process. The whole week working hard with my colleagues and experiencing, through movement, gesture, improvisation, new ways of musicking. To sum up, the concert was a reflection on what happened that week. At the end, that is what concerts reflect, somehow, but this time it was more clear than ever. I hope that next year there will be a similar immersion project! Thank you very much!

Student 7
I felt very present in each moment in this concert, and it did also seem to go by very quickly.
Particularly after the first piece went well, the whole concert took on its own momentum, and it was easy to be within the sound and focus on sound and contact with the other players.
With most concerts it feels like there is a list of things to remember 'do this, don't do this'. Without this in this concert I think it was possible to stay closer in touch with the music.

Student 8

I think the connection between musicians, the authenticity and the aliveness and "on the spot" of the concert were very much remarkable.

Suggestions that may help a project like this to work more effectively

Student 1
It would be great to work most of the time without the instruments, to really have in the body and the mind all we want to do before translating it into playing.

Student 2
To extend the project, in order to have enough time to accumulate all the information without hurry.

Student 3
For me, two things would have helped the project a lot.: one, Planning more in advance, to ensure everyone is available for everything, and two, to find people fully committed to the ideas behind the project (or, at least committed to trying them). This would make it more immersive, and more connected to the final product.

Student 4 (Student 4 only attended rehearsals and concert)
I would say the only thing, which 'bothered' me was that sometimes some musicians weren't willing to participate to the way of rehearsing, for example the gesture/singing exercise. I found it really interesting but I would say that there is no need to oblige people who find that too embarrassing … I just felt some tensions around that exercise which weren't needed with the short amount of time that we had to rehearse.

Student 5
I feel that the movement sessions are best scheduled before a break (right before lunch) or first thing in the morning. A break is essential for my body to feel what is different, and to get it into a more appropriate condition for playing the instrument.

Student 6
Being more specific with the schedule from the first day. The first day was a bit messy and that could discourage the participants, though afterwards things went well. I think it has to do with doing less, but more specific stuff.

Student 7
It would have been nicer for the sense of the whole group if more people had made every session but of course this is difficult to control.

Student 8
Maybe a little better organisation (sometimes I had to wait 1'30 minutes to play 15 minutes) with the people needed in each piece. But it was fantastic and it didn't feel as a "school project" but as chamber music.

Appendix T Program for "Macht und Musik" (Project Two)

Macht und Musik: PROGRAM

Girolamo Fantini (ca. 1600 - ca. 1675) — Improvisations on Sonata detta del Gucciardini

TEXT: The Trumpet: from signals to ceremonies to Art Music

Claudio Monteverdi (1567 – 1643) — Toccata aus L'Orfeo

TEXT: How to play the trumpet: Demonstration
TEXT: Introducing Versailles

Jean Baptiste Lully (1632 - 1687) — La descent de Mars

TEXT: Life at Versailles

Jaques Danican Philidor (1657 -1708) — Marche de Timbales

Marc-Antoine Charpentier (1643 - 1704) — Prelude aus Te Deum

TEXT: The Life of a Trumpeter Part 1: Ausbildung

Heinrich Ignaz Franz Biber (1644 - 1704) — Sonata a 7

TEXT: Kremsier

Sonata Policarpi

TEXT: The Life of a Trumpeter Part 2: Der Kameradschaft und der Feldtrompeter
TEXT: Pferdenballet

Johann Heinrich Schmelzer (1620 - 1680) — Pferdenballet

TEXT: The Life of a Trumpeter Part 3: Hoftrompeter

Jan Dismus Zelenka (1679 - 1745) & Anon (ca. 1750) — 2 Dresdener Fanfares

TEXT: What happened in London

Georg Friederich Händel (1685 -1759) — Music from the Royal Fireworks
Menuet & La Rejouissance

TEXT: end of the Golden Age of the Trumpet

Johann Ernst Altenburg (1734 - 1801) — Konzert für 7 Clarini & Pauken

TEXT for the narrator (English in blue and German in black)

TEXT: The Trumpet: from signals to ceremonies to Art Music

The trumpet: Instrument of heavenly and earthly power and illumination.
From antiquity used for signalling, for the hunt, for making announcements; for rousing soldiers in battle and frightening the enemy. What a noble instrument.
And now – in our illustrious times every regiment has trumpeters and every court.
And the most important show their power by the size and virtuosity of their trumpet ensembles.
But our noble instrument is not just for ceremony and for war – it is now truly an art instrument, and this is no better illustrated than here in Germany – where the best trumpeters are trained and exported to all the great courts of Europe. But the first melodious sounds were heard in Italy. The great virtuoso Girolamo Fantini: trumpeter am Hof des Grosherzogs der Toscana, Ferdinand II von Medici played for the pope himself. His playing was said to be so fine that is not only could rouse Mars but charm Venus…
And of course that great moment in February 1607 at the opening of Monteverdi's opera L'Orfeo a fanfare was performed to celebrate the birthday of Franchesco IV Gonzaga. The astonishment on the faces of that audience to hear how melodious the trumpet can be!

TEXT: Die Trompete: von Signalen zu Zeremonien zur Kunstmusik

Die Trompete: Instrument der himmlischen und Irdischen Macht und Glanz. Im Altertum benutzte man sie für Signale; für die Jagd, für Ansagen; um Soldaten in der Schlacht zu Dirigieren und um den Feind einzuschüchtern. Was für ein nobles Instrument!
Und jetzt – in unseren glorreichen Zeiten, hat jedes wichtige Regiment und jeder Hof sein eigenes Trompetenensemble und die mächtigsten würden ihre Macht mit der Größe und Virtuosität Ihres Ensembles zeigen.
Aber unser nobles Instrument wird nicht mehr nur für Krieg und Zeremonien benutzt – heut zu Tage ist es ein wahres Kunstinstrument, und dies kann man nirgendwo besser sehen als in Deutschland, wo die besten Trompeter trainiert und in alle großen Höfe Europas exportiert werden. Doch die ersten melodischen Trompetentöne erklangen in Italien.
Der Größte Virtuose Girolamo Fantini: Trompeter am Hof des Grosherzogs der Toscana, Ferdinand II von Medici, spielte für den Papst höchst persönlich. Es wird gesagt, dass seine Musik währe so gut das sie nicht nur Mars aufjagen, sondern auch Venus verzaubern konnte.
Und der große Moment der Geschichte der Trompete war die Premiere der Oper L'Orfeo von Monteverdi im Februar 1607. Eine Fanfare wurde gespielt um den Geburtstag von Franchesco IV Gonzaga zu feiern. Stellt euch die Überraschung auf dem Gesichtern der Zuhörer vor als sie hörten wie Künstlerisch die Trompete sein kann.

TEXT: The Life of a Trumpeter Part 1: Ausbildung

I come from a military family, but not a rich one. My father was a musketeer in the guard of Bishop Karl. I went to a strict Jesuit school and learnt Greek, Latin, rhetoric and music. I had a proper music education – I learned to play violin and organ. But since I was a small boy I only wanted to play the trumpet. The trumpeters at the regiment where my father served played ceremonial music for the important visitors and events and were the most honoured and respected of musician (status). With wonderful uniforms!

Not many boys could get a decent sound out of this thing. And even fewer could play the high notes. Only when you can play the high tones, is it possible to play a melody and be a kunsttrompeter.

TEXT: Das Leben eines Trompeters: Ausbildung

Ich komme ursprünglich aus einer Militärs Familie. Aber keiner reichen. Mein Vater war als Musketier im Regime von Bischof Karl I tätig.
Ich bin in eine streng christlichen Schule gegangen und hatte täglich Griechisch, Latein, Rhetorik und Musik. Die musikalische Ausbildung dort war vorbildlich und ich fand es spannend Geige und Orgel zu lernen. Mein Herz aber hat sich schon seit frühster Kindheit der Trompete verschrieben.
Die Trompeter im Regime meines Vaters trugen wunderbare Uniformen und spielten meist an Eröffnungszeremonien wenn hoher Besuch an stand. Ich bewunderte sie aus tiefstem Herzen!! Sie waren die höchst angesehensten und respektiertesten Musiker! Nicht zu guter letzt weil nicht viele Jungen oder Männer Probleme hatten überhaupt einen Ton aus diesem Instrument herausbekommen!!! Wenn ihnen das dann doch geglückt ist, waren noch weniger mit der Gabe gesegnet hohe Passagen zu spielen! Nur, wer diese hohen, melodischen Passagen zu spielen vermochte, dem war es gestattet sich Kunsttrompeter zu nennen und bei diesen pompösen Veranstaltungen mitzuwirken!!

TEXT: How to play the trumpet: Demonstration

Gottfried! – show us. (demo) Now – how do we get a lower tone, or a higher one?? To play lower, the air needs to go slower (demo). To play higher, it needs to go faster (demo). How do we strike just the right one that we need to play music?? That's our secret!

TEXT: Wie Mann Trompete spielt

Gottfried! Zeig uns wie das geht!!! Aber, wie bekommt man einen tieferen Ton? Oder ein höhreren? Wenn man tiefere Töne spielen will, muss die Luft langsamer durch das Instrument strömen. Im Gegensatz dazu, wenn man die imposanten hohen Passagen spielen möchte muss die Luft schneller sein! So schön so gut! Aber wie trifft man dann die richtigen Töne?? hm, Das bleibt unser (kleines) Geheimnis!!!

TEXT: Introducing Versailles:

I think the worst job for a trumpet player would have been to play in Le Grand Ecurie – the consort of the great Sun King at Versailles in France. It is said that the Sun King would chop off the hand of anyone who displeases him! Imagine playing a wrong note for the entrance of Louis XIV!

TEXT: Einleitung Versailles

Aus meiner tiefsten Überzeugung kann ich mit Gewissheit sagen dass diejenigen Trompeter, die Luis XIV dienen, die Ärmsten unserer Sorte sind!!! Es ist schon traurig, dass der Sonnenkönig jedem die Hand abschlägt, der ihm zu wieder ist. Stell dir doch mal vor, du spielst EINE Flasche Note beim Einzug von Luis XIV…

TEXT: Life at Versailles

Versailles. Every court in Europe wishes to copy this most extravagant of palaces. The aristocracy were all forced to live there, and so Louis controlled them! How tedious they found it to be trapped outside Paris in this spectacular prison. It was most important that they are entertained. And what entertainment! Operas, festivities, dancing, banquets. Always the King himself at the centre. He was very impressive, and a great dancer. His composers and musicians were renowned. Versailles was the

only place in France where you would hear a trumpet – it being the royal instrument and was

That magnificent Te Deum by the great Charpentier was said to have been written to thank God for France's victory at the battle of Steinkirk. A decisive battle in the nine-year's war. France was victorious over the allied armies of England, Holland and Germany. But many thousands died. Viva la France.

TEXT: Das Leben in Versailles

Versailles! Jedes Königshaus in Europa möchte so extravagant und angesehen sein! Alle Aristokraten wurden gezwungen dort zu leben, damit Luis sie kontrollieren und ihnen auf die Finger schauen konnte! Es war unglaublich langweilig in diesem goldenen Käfig gefangen zu sein, fernab von dem pulsierenden Leben in Paris. Da ist es nicht verwunderlich, dass die größte Herausforderung darin Bestand den Hof zu unterhalten! Und ich kann Ihnen sagen! Was für eine Unterhaltung!! Opernbälle, Festival, Tanzabende, Banquets- und natürlich war immer Louis der Mittelpunkt des Geschehens. Natürlich, er war ja auch eine imposante Persönlichkeit UND ein herausragender Tänzer! Ohne Zweifel!! Die Komponisten die für ihn schrieben und die Musiker, die für ihn spielen durften waren die wohl berühmtesten und angesehensten überhaupt!

Ich vermag es gar nicht zu sagen, aber Versailles war der einzige Ort in ganz Frankreich wo man überhaupt Trompeter hören konnte! Es ist nun einmal DAS königlich Instrument schlecht hin und Charpentier's Te Deum, so sagt man wurde extra komponiert um Gott für den Triumph im Krieg von Steinkirk zu danken!! Ein Gefecht, was 9 Jahre andauerte und vielen Menschen das Leben kostete!! Am Ende war es Frankreich die über England, Deutschland und Holland siegten! Lang Lebe Frankreich! VIVA la FRANCE!!

TEXT: Kremsier

I've heard tell that one of the finest trumpet consorts ever was in the court of he Prince Bishop of Kremsier in Bohemia. For two reasons, I think. This prince Bishop was a great music lover and collected the music oft he best composers oft he Austro-Hungarian empire. The great Biber was Capellmeister there for a time. The other reason is that he hired the very best trumpeters. Not just one or two could play the high notes – you just heard: all 8 of them did!

TEXT: Kremsier

Es ist bekannt, das eins der besten Trompetenconsorts alle Zeiten im Schloß Kremsier des Prinz-Bischofs Karl von Lichtenstein gespielt wurde. Ich denke dies aus zwei Gründen. Er war ein großer Musikliebhaber und sammelte die Musik der besten Komponisten des Österreich-Ungarnischen Reiches. Der Große Komponist Biber war dort Kapellmeister. Sein Nachfolger war der Trompetenvirtuos Pavel Vejvanowsky. Der andere Grund ist dass er die besten Trompeter einstellte. Nicht nur ein oder zwei konnten die hohen Töne spielen, sondern, wie Ihr alle gerade gehört habt – alle acht!!

TEXT: The Life of a Trumpeter Part 2: Der Kameradschaft und der Feldtrompeter

My privileged life of a court trumpeter came at a high cost. After my musical education I could have become a Stadtpfeifer but to be a proper trumpeter, I had to join the Guild/Kameradschaft. First I was apprenticed to a Feldtrompeter member of the Kameradschaft. I had to learn military signals, pass my exam and then go on

campaign for 7 long years. Now I have a position in court and can once again enjoy my more musical skills. I am now in the service of King Leopold himself. Some years ago I took part in his most spectacular wedding.

Mein privilegiertes Leben als Hoftrompeter kam nicht ohne Kosten. Nach meiner musikalischen Ausbildung hätte ich Stadtpfeifer werden können aber um ein richtiger Trompeter zu werden musste ich der Kameradschaft beitreten. Erst wurde ich Lehrling zum Feldtrompeter Mitglied der Kameradschaft. Ich musste viele militärische Signale lernen, meine Prüfung bestehen und dann für sieben lange Jahre auf Kampagne gehen. Jetzt habe ich eine Position auf dem Hof und kann mich wieder meine musikalischen Fähigkeiten vergnügen. Meine erste Stelle habe Ich für keinem anderen als König Leopold gespielt. Vor ein paar Jahren nahm ich an einer seiner spektakulärsten Hochzeiten teil.

TEXT: Pferdenballet

1673 wurde anlässlich der Hochzeit von Leopold I. mit der spanischen Infantin Margarita, ein gigantische Fest gefeiert. Neben aufwendigen Darstellungen mit mythologischen Inhalten wurde dieses, in diesem Umfang nie wieder gesehenes Pferdeballett aufgeführt. 1700 Teilnehmer und 600 Pferde probten über ein Jahr lang. Der Kaiser ritt selbst einen der Springer, d.h. er führte Schulen über der Erde aus. Die Musik, die u.a. von Johann Heinrich Schmelzer komponiert worden war, wurde von 100 Instrumentalisten (Zinken, Posaunen, Trompeten, Oboen, Fagotte und Streicher) von verschiedenen Positionen simultan und im Echo ausgeführt.

TEXT: The Life of a Trumpeter Part 3: Hoftrompeter

I am glad now I joined the Kameradschaft. One of my old friends from school – a fine trumpeter and stadpfeifer – ran into some trouble. Some members of the Kameradschaft came to his door and knocked out his teeth so he couldn't play anymore! They are very jealous of the Stadtpfeifer and call them ungelernten! I know this is not right. The great Gottfried Reiche – trumpeter in Leipzig under Johann Sebastian Bach – he is a Stadpfeifer, and so highly regarded that when the king died and there was no music for a year (all musicians had to leave and find employment elsewhere) – they paid him to stay in Leipzig until music was allowed again! That is how valuable a good trumpeter is!

TEXT: Das Leben eines Trompeters Teil 3: Hoftrompeter

Jetzt bin ich froh dass ich der Kameradschaft beigetreten bin. Ein alter Schulfreund von mir – ein exzellenter Stadtpfeifer-trompeter – fiel in eine Katastrophe. Ein Paar Trompeter der Kameradschaft besuchten sein Haus und schlugen Ihm die Zähne aus, damit er nicht mehr spielen konnte. Die Kameradschaft ist mag es nicht das Leute von Außerhalb die Trompete spielen. Sie nennen Sie ‚ungelehrt'. Ich weiß dass es nicht stimmt. Der berühmte Gottfried Reiche – Trompeter in Leipzig unter Johann Sebastian Bach – ist ein Stadtpfeifer, und so hoch angesehen das als der König starb und es für ein Jahr keine Musik gab, er bezahlt wurde um dort zu bleiben obwohl alle Andern wegzogen um anderswo Arbeit zu finden, bis Musik wieder erlaubt wurde! Da sieht man wie wertvoll ein gute Trompeter ist.

TEXT: Dresden

Now I serve King Frederick the Great of Saxony. He has tried to outshine the Sun King of France with his Zwinger Palace. Such decadence and grandeur I have not seen in my long years of travel. And to match it – he has a trumpet consort of unparalleled magnificence and refinement.

Jetzt diene ich König Friedrich August der Starke...

TEXT: What happened in London

Did you hear about what happened in London?!
Hardly anything went according to plan. The sky was darkened by smoke, the stage became an inferno and its architect spent the night in jail. Händel's suite of six movements – originally written for trumpets, horns, oboes, bassoons, timpani and percussion – was meant to celebrate the signed Treaty of Aken in the spring of 1749. This treaty marked the end of the war with Spain.
Nearly 12.000 spectators came to witness what was only a rehearsal on the 21th of April in Vauxhall Pleasure Gardens in London. Commissioned by George II, Händel wrote his orchestral suite which would be accompanied by a fireworks show. The premiere on the 27th of April started at 18.00 while it was still light outside. The fireworks show that was supposed to happen an hour later became a disaster. The whole stage was lit in flames and some visitors were struck by rogue firecrackers. An eyewitness said: "The rockets succeeded mighty well... but the wheels and all that was to compose the principal part were pitiful and ill conducted... the illumination was mean, and lighted so slowly that scarcely anybody had patience to wait the finishing."

Hast du gehört was in London passiert ist? Fast gar nichts lief nach Plan. Der Himmel war verdeckt durch Rauch; die Bühne wurde zum Inferno und dessen Architekt verbrachte die Nacht im Gefängnis. Händel's 6 sätzige Suite für Trompeten, Hörner, Oboen, Fagotten und Schlagzeug war geschrieben um das Friedensabkommen nach dem Krieg gegen Spanien zu feiern. Zur Begleitung war ein Großes Feuerwerk geplant aber alles lief falsch. Sogar ein paar Zuschauer wurden von unkontrollierten Feuerwerk getroffen! The King was not amused!

TEXT: end of the Golden Age of the Trumpet

Now I am turning 35, an accomplished and respected Feldtrompeter. I have travelled the World, seen many wonders, the splendor of all the famous courts. However, my spirits are low, I see our noble Art of the Trumpet playing declining. The young trumpeters nowadays are not eager to follow the path of a richtiger Feldtrompeter preferring a safe life of a Stadtpfeiffer to the noble Trumpet Art. Trumpet Masters are training more Trompeterjungen than they can properly train. Even my own sons decided to take places as Stadtpfeiffer, when they were offered.
(original text from Altenburg, 1795):

To finish in good style - here is a piece by the great Altenburg – trumpeter, author of 'Versuch einer Anleitung zur heroisch-musikalischen Trompeter- und Paukerkunst', showing what our glorious instrument is capable of.

TEXT: Das ende des goldenen Zeitalters

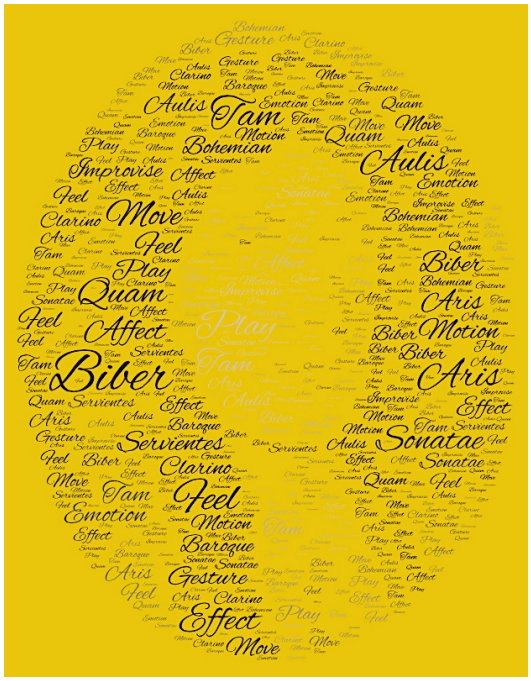
Mit nun [35] Jahren bin ich ein respektierter Hoftrompeter, der, wie ich sagen muss, viel erreicht hat in seinem Leben! Ich habe die halbe Welt, viele Königshäuser und einige Wunder gesehen! Wie auch immer! Das Leben als Trompeter wird mit Sicherheit nicht einfacher und ich wage zu behaupten dass unser eins eines Tages gänzlich verschwunden sein wird!! Die nachfolgende junge Generation wird immer aufmüpfiger! Sie hält sich nicht mehr an das Reglement und den Weg eines Feldtrompeters! Immer mehr bevorzugen den sicheren und einfacheren Weg und

werden Stadtpfeifer, was unserem noblen Gewerbe nicht zu gute kommt! Meister ihres Instruments Unterrichten mehr und mehr junge Sprösslinge, vergessen dabei aber, dass die Anzahl der Arbeitsplätze nicht mit Ihnen wächst!! Sogar meine eigenen Söhne bevorzugen nicht in die Fußstapfen Ihres Vaters zu treten! Sie wollen, wenn sie ein Angebot bekommen auch lieber als Stadtpfeifer ihr Geld verdienen!

[Historischer Text aus Altenburg, 1795]
"Nun ist aber unser Kunst jetziger Zeit in großer Gefahr / nicht allein deß großen Defekts und mangels / dadurch unverständige Leute unser Stand dermaßen verkleinert und in Verachtung gesetzt wird / [...] sondern auch [...] in dem außer unvollkommener Unterrichtung und Bereifung / so viel Stümpler und Hümpler in allen Städten und Dörfern sich finden / und [...] wie Mausekoth munter Pfeffer zu unsern Konsorten begeben / das ein ehrlicher und erfahrener Trompeter seine Kunst fast möchte schweren tragen.“

Zum Schluss hören Sie nun ein Stück von dem hochgeschätzten Herrn Altenburg, der Autor des ‚Versuch einer Anleitung zur Heroisch- musikalischen Trompeter- und Paukerkunst’ der Sie auf eine Reise mitnimmt und sie einlädt den wunderbaren und königlichen Klängen unseres einzigartigen Instruments zu lauschen!

Appendix U Program for the "Biber Immersion Project" (Project Three)



Heinrich Ignaz Franz Biber

Sonatae tam aris quam aulis servientes

This concert is dedicated to Nikolaus Harnoncourt

Thanks to our guest coaches and lecturers Fajo Jansen, Florencia Gómez and Valentina Villaseñor
for making this week inspiring, rich and rewarding,

and to the Nieuwe Badkapel

Koninklijk Conservatorium
Royal Conservatoire

The Biber Immersion Project

Tonight's presentation is the culmination of an innovative pedagogical project at The Royal Conservatory in Den Haag. During the five-day preparation period, the musicians took part in dance and movement sessions designed to explore rhetorical gesture, emotion and affect in baroque music. Lectures on affect and on the baroque court of Kroměříž were also included, as well as improvisation sessions. The concept behind this approach is that music-making needs to be developed in a holistic way, involving body, mind and emotion. This approach is one that has been used and taught by the two coaches of this project – Susan Williams and Rachael Beesley over the last decade. Motion, emotion, movement and moving an audience are concepts that were familiar to the 17th century musician.

In today's technical age, there is a tendency for musicians to focus their attention on the (intricate) movements needed for playing or on the technical details of the music, as well as on avoiding errors/wrong notes. There is increasing evidence from scientific research that challenges this approach, suggesting that both learning and performing music is best facilitated by a musical rather than a technical focus. The workshop sessions for this project used information and concepts from both the 17th and 21st centuries to explore the rhetoric, gesture and expression in and through Biber's sonatas.

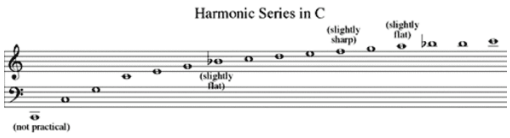
> *'... New methods – or methods similar to those used over two hundred years ago – must be used to train musicians. Rather than teaching music as a language, our academies drill only techniques of performance. This focus is, however, merely the lifeless skeleton of technocracy.'* (Nicholas Harnoncourt)

The Biber Immersion Project is a synthesis of a 17th century approach to music-making, knowledge from modern science and innovative pedagogy.

Biber and the *Sonatae tam aris quam aulis servientes*

Paul Hindemith described Biber as 'the most remarkable composer before Bach' and Leopold Mozart instructed his son Wolfgang Amadeaus to study Biber's works. Like Bach, Biber wrote idiomatic and virtuosic trumpet music. These two composers had access to virtuosic trumpet players and wrote some of the most technically and musically challenging trumpet music of the time. Pavel Vejvanovsky, trumpeter at the Moravian town of Kroměříž where Biber worked and later himself Kapelmeister, was well known for his brilliant playing and ability to play enharmonic notes. Sonata X is a beautiful example of how Biber takes advantage of this by including several tones not in the harmonic series of the instrument. The sonata is in G minor – a very unusual key for trumpet music.

The natural trumpet can only play the natural harmonic series. Each note is produced by an exact form and speed of air. The 'vent holes' on trumpets used by many players today help compensate for the intonation problems of the 11th and 13th harmonics.



Biber was himself a virtuoso on the violin and this is evident in his compositions. The string parts although idiomatic, require technical and musical virtuosity. Biber's compositions are often inspired from traditional folk music and invite a spontaneous, evocative and energetic approach. During Biber's time at Kroměříž, this wealthy palace held a superb collection of art, an extensive library including many musical manuscripts and housed an impressive band of 36 musicians.

The *Sonatae tam aris quam aulis servientes* (ca. 1676) – 'instrumental movements that can be used for the altar as well as at court' – are a set of pieces written to be played either in a sacred or secular context. In this way, Biber tried to bypass the ban on the sonata da camera in the church at the time in order make his music accessible and commercial.

Susan Williams

Susan Williams is one of the world's most well known specialists in baroque trumpet and has been performing and recording with many of Europe's finest early music ensembles since the 1990s, as soloist, chamber musician and in orchestras.

She teaches at The Royal Conservatorium of The Hague (since 1989) and the University of the Arts in Bremen (since 2004), as well as giving yearly workshops in various other institutions. In addition to teaching natural trumpet and leading ensemble projects and workshops, Susan is involved in research in the field of performance science. She is giving courses in practicing and performance preparation in both institutions.

Susan is currently undergoing a doctoral study at Leiden University and in the docARTES program. Her research is inquiring into what kind of attentional focus (both in the practice room and on stage) enhances skill acquisition and optimal performance.

Rachael Beesley

Rachael Beesley - Internationally renowned violinist, university lecturer & teacher at the The Royal Conservatoire, The Hague, NL, Melbourne and Sydney Conservatories, Monash University and distinguished Artist-in-Resident at ANU School of Music, Australia. Graduate from the VCA University of Melbourne - BA in Music (1989), Grad Dip of Arts in Music (1991) and from The Royal Conservatoire, The Hague, NL - Master of Music (1999).

Rachael is a versatile violinist and musician who has devoted her life to performing, teaching, and researching in the fields of Historically Informed Performance Practice and Practising in Flow. Rachael is guest concertmaster & director with the crème of European and Australian orchestras with numerous festival, radio and television appearances, is recording artist on over 50 CD recordings and is listed in the Who's Who of Australian Women.

Program

Sonatae tam aris quam aulis servientes

Sonata a otto in C

Sonata a sei in G minor

Duet

Sonata a cinque in C

Duet

Sonata a cinque in F

Duet

Sonata a cinque in C

Duet

Sonata a cinque in B ♭

Duet

Sonata a cinque in G minor

Duet

Sonata a cinque in A

Sonata a otto in C

Musicians

Trumpet: Nadine Baer, Patrice Boleau, Sóley Björk Einarsdóttir, Danny Teong, Susan Williams

Violin: Rachael Beesley, Caitriona O'Mahony, Paula Perez Romero, May Robertson, Christine Verdon, Nathalie Verdon

Viola da Gamba: Evan Buttar, Garance Boizot, Alon Portal, Alessia Travaglini

Organ: Valentina Villaseñor **Harspichord:** Talia Franco,

Archlute: Punto Bawono **Violone:** Zhou Feng

Appendix V Schedule for the "Biber Immersion Project"

BIBER Immersion Project: Schedule

When	What	Where	Sonata number
Sunday 3 April		Studio 3:[Organ & Harpsichord]	
10.30	Lecture & Intro	Music as a language	TUTTI
11.30	Play through	Studio 3	I-XII
13.15-14.00	Pause		
14.00-15.00	Movement	Ballet studio	TUTTI
15.00-15.45	Rehearse/Improv	Studio 3	I-XII
15.45-17.30	Rehearse	Studio 3	I, VII, XII
Monday 4 April		SON 14 [Organ]	
10.00-11.00	Lecture: Florencia	SON 14 [Organ]	TUTTI
11.00-13.00	Rehearse	Strings in SON 14	IV, X, VI
11.00-13.00	Rehearse	Trumpets in M504	all trumpet pieces + Talia
13.00-14.00	Pause		
14.00-15.00	Improv	TUTTI in SON 14	
15.00-17.00	Rehearse	Strings in SON 14	II,III, VIII
17.00-18.00	Lecture: Petr	SON 14	TUTTI
18.00-20.00	optional time	SON 14	
Tuesday 5 April	**10.00-17.00**	SON 03 [Organ & Harpsichord]	
10.00-11.00	Movement	Ballet Studio	
11.00-12.45	Rehearse	SON 03	I, XII
12.45-14.00	Pause		
14.00-15.00	Improv	SON 03	TUTTI
15.00-16.30	Rehearse	SON 03	IX, XI
18.00-20.00	Rehearse	SON 03	II, VI, V
20.00-21.00	optional time	SON 03	
Wednesday 6 April	**10.00-17.00**	**Nieuwe Badkapel**	
10.00-11.00	Movement		TUTTI
11.00-13.00	Rehearse		IV, X, III, V
13.00-14.00	Pause		
14.00	Improv		
15.00-17.00	Rehearse		VII, XI, IX, VIII
Thursday 7 April	**10.00-17.00**	**Nieuwe Badkapel**	
10.00-11.00	Movement		TUTTI
11.00-12.00	Lecture: Rachael		TUTTI
12.00-14.00	General rehearsal		TUTTI
16.00-18.00	Reserve		TUTTI
20.00	**CONCERT**	**Nieuwe Badkapel**	

Lecture topics

Sunday	Susan Williams	Music as a Language
Monday: 10.00	Florencia Gomez	Passions and Affects
Wednesday	Rachael Beesley	Biber and the violin

Appendix W Teacher Training Document

Motor learning for musicians

Theory and practice

Royal Conservatorium The Hague 06.03.2018

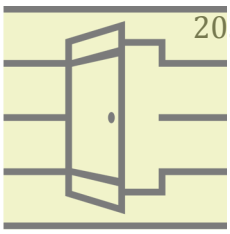
Susan Williams

The staff of the Royal Conservatoire, The Hague, who did the staff development program in 2018 were presented with current motor learning theories including *The Theory of Implicit Motor Learning* (Rich Masters), *The OPTIMAL Theory of Motor Learning* (Wulf and Lewthwaite) and *Flow Theory* (Mihaly Csikszentmihalyi).

Break out groups were formed to discuss elements of the theory and asked, "What would this theoretical concept mean for your teaching?" "Do you recognise it?" and "What would be applications in your lessons?"

The insights listed in implications & applications on the following pages are a result of the group brainstorming and discussions.

IMPLICIT MOTOR LEARNING



Motor learning is best learned implicitly – without too much verbal instruction: a procedural (learning through doing) process rather than a declarative (learning through conscious understanding) one.

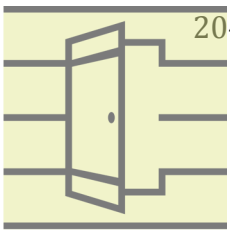
Cognitive load theory: The brain has limited capacity. One can focus intensely for around 20 minutes at a time. Too much verbal information at once, too much sensory input, unexpected occurrences or multitasking can result in cognitive overload. Practicing (and learning in general) could be more a matter of managing cognitive load than what methods or strategies are being used.

Implications & applications

- Learning through modelling: the teacher plays for or with the student
- Trusting the process rather than looking for immediate results
- Encourage exploration and free music- making: 'perfection' is not the goal
- Check if the task is too complex or stressful and find strategies to be in the task
- Avoid verbal and technical instructions
- Look for musical and expressive terms & concepts rather than technical ones
- Encourage students to experiment, improvise and play variations
- Look for ways to be in the senses: touch, hearing, sight and develop rich imagination
- Learn to accept mistakes
- Learn to let go of needing to intellectually understand or control everything

Instead of asking, "How does it work?" a musician needs to ask, "What do I need to do in order for it to work?"

AUTONOMY



The student should have choices. Rather than passively receive instructions, a student needs to develop a sense of agency. Even small or incidental choices have a positive effect on learning. Important to autonomy is students develop self-regulation and intrinsic motivation.

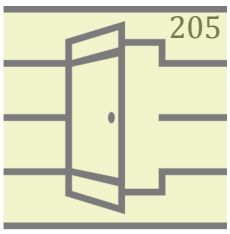
Self-regulation: the ability to set goals, make strategies and reflect on the outcomes.
Intrinsic motivation: playing music becomes its own reward.

Implications & applications

Ideas on how we can promote autonomy in our students:

- Ask questions
- Limit feedback and let the student lead the feedback
- Encourage students look for their own musical ideas: "how do you want that to sound?"
- Check what the student wants to learn
- Let the student choose repertoire
- Help the student feel ownership of their process and not just focus on the result (or grade)
- Help the student understand why they are learning a particular skill or piece of repertoire
- Ask the student how they practice
- Encourage the student to make recordings and judge themselves
- Wait for a question or insight before giving a quick fix – ask a leading question
- Remind the student s/he is playing for her/him self

Students need to develop agency by realising that they are responsible for their own process and that they have choices. Many individuals want or need some external rules and structure and extrinsic motivation. Self-regulation and self-reflection can be learned.



ENHANCED EXPECTANCIES

A musician's own beliefs and expectancies should be positive in order to learn or perform well. Developing an open mindset and high self-efficacy plays a part, as does success with challenge and positive feedback.

- Open Mindset beliefs: belief in effort vs. talent; enjoying challenge; experiencing mistakes as information
- Closed Mindset beliefs: capacities are fixed; stay in the comfort zone; mistakes are bad; "if I can't do it, I'm not talented"
- Self-efficacy: a person's belief about their ability to learn

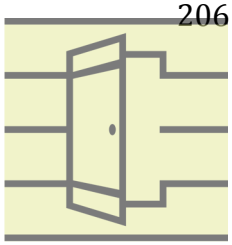
Implications & applications

In order to support the student in their belief that they can learn, we can give the following messages in lessons:

- Point out when something works / goes well
- Build your expertise by choosing challenging but do-able goals
- Learn to enjoy challenge
- The process is the goal
- Give yourself the space to learn
- Find ways to enhance quality learning, listening, imagining and performing
- Find a balance between building self-confidence and finding room for expressive experimentation
- Don't think 'problems' but 'possibilities'
- Mistakes are part of the game – and provide valuable information
- Learn about your own struggle and development through peer learning – by recognising yourself in the other
- Success = a good learning moment
- Confidence comes from recognising your development and is fed by opening your fantasy

The role of the teacher is to help the student choose challenging but achievable goals and to recognise when they are met, leading to an accumulation of 'mastery experiences' resulting in self-confidence and motivation.

EXTERNAL FOCUS



Instructions and feedback need to focus attention on the desired *effect* of the movements rather than on steering, controlling or analysing the individual movements of the body. This involves focusing on the intended goal (i.e. the desired sound or musical intentions) rather than on how. Using external focus allows the intended goal to inform the motor control system to find or refine the movements needed to attain the goal.

Audiation – a form of external focus – involves approaching the music as if it is language. It involves being able to hear music before it is physically present (anticipatory auditory imagery) and having a sense of what it is portraying.

Important to external focus is vividness, detail and clarity.

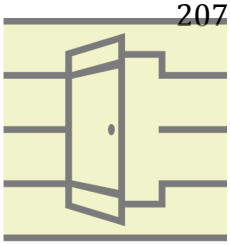
Implications & applications

Teaching students to explore repertoire and skill development is a non-verbal, non-technical way:

- Connect sound and language (communicating meaning & expression)
- Encourage students to practice musical intention: e.g. "What do I want to sound like / say?" "What do I want the listener to feel?"
- Find ways to develop the ability to develop imagination that is vivid, and has complexity and nuance
- Use metaphors and analogies
- Make narratives or invent scenarios or subtexts
- Think of words to go with a phrase to make it more meaningful
- Gesture and sing the music to 'feel' it's meaning
- Practice variations – vary the entire character of a phrase
- Dancers: focus on fluency, phrasing and expression. Imagine images and metaphors, explore the space and dance 'musically' – even when there is no sound present

Encourage students to practice by getting to know more clearly what they want to say, what the audience should feel, what effect they want to make and what emotions are embedded in the music. Notice how clarifying musical intention effects technique.

FLOW

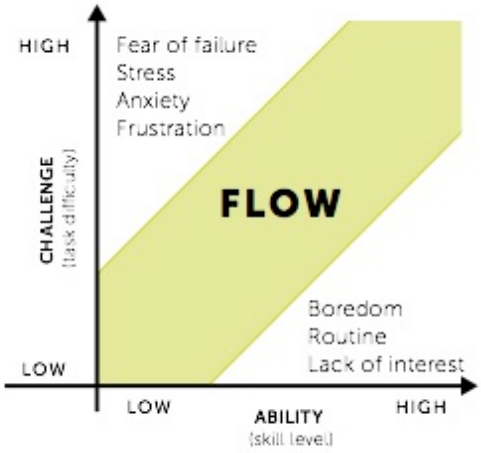


Being in 'flow' is total engagement/immersion in a task: *"... being completely involved in an activity for its own sake. The ego falls away. Time flies. Every action, movement and thought follows inevitably from the previous one. Your whole being is involved, and you're using your skills to the utmost."*

Prerequisites to Flow are:

- Clarity of goals and immediate feedback
- Concentration on a limited field
- Balance of skill and challenge

Balancing skills and challenge
When in flow, challenge and skills are balanced.
Challenge refers to the *perceived* challenge: it is possible to lower the challenge by lowering one's goal or expectations



Implications & applications

Ways and keys to promoting flow in the student and in the lesson:

- Find ways to be totally involved and engaged whilst playing
- Concentrate on sensory awareness
- Look for effortlessness and enjoyment
- Have a clear goal
- Look for flow in teaching
- Find mutual goals when teaching
- Have a moment in the lesson to integrate everything
- Be in the music
- Ask the student about their experiences of flow
- Ask the student interpretive questions
- Find the right expectation to fit the goal
- Mutual inspiration
- Don't think too much
- Develop confidence
- Don't be afraid (of the teacher)

Flow is the ultimate goal. Excellent playing and success are side effects.

Appendix X *Quality Practice: a Musician's Guide*

See separate pdf file