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

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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").

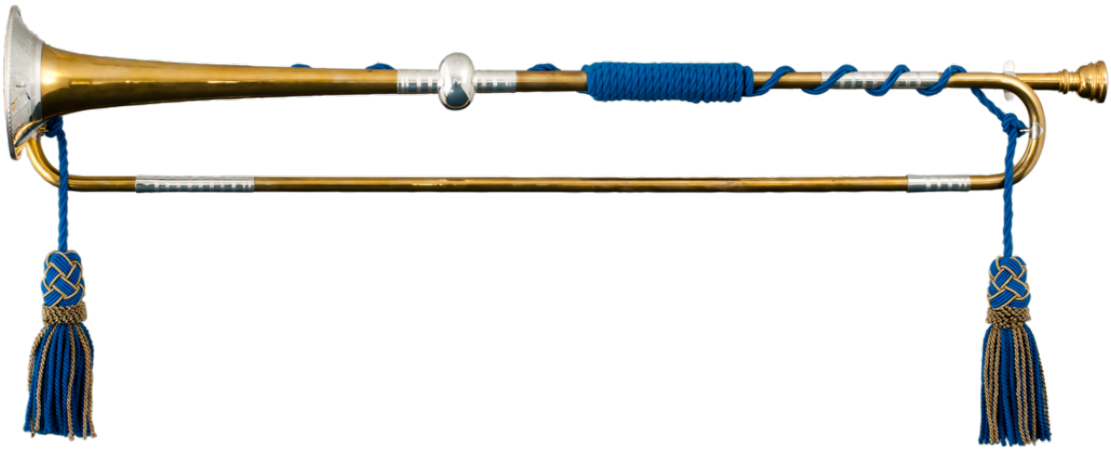
- Many students suffer from injury problems connected with playing.
- There is limited knowledge of how to practice – most students use two or three standard methods (e.g. repetition, playing slowly, changing rhythm).
- Most students rely solely on the main subject teacher for guidance in how to play 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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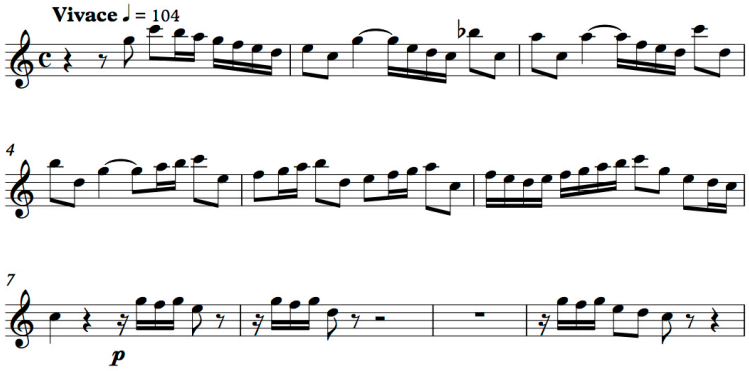
[6] Harnoncourt was not the first to complain about the conservatoire system's inadequacies. For example, in his essay *Unsere Konservatorien* (1895), Hugo Riemann stated "Die heute fast allgemeine *ausschließliche Dressur auf praktische Musikausübung* ist eine traurige Errungenschaft der neuesten Zeit, 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

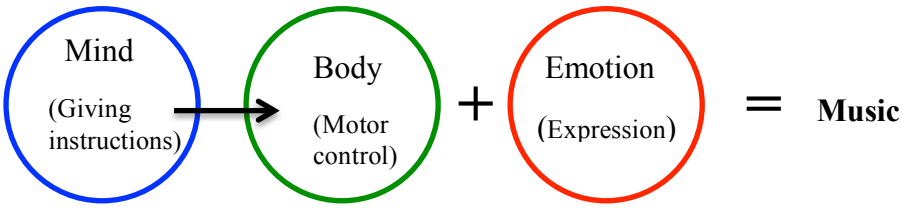


Figure 0.3. A model illustrating how instructions (from the mind) attempt to steer the body's movements in order to produce a precise technical result. After this is achieved, the player can add expression.

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

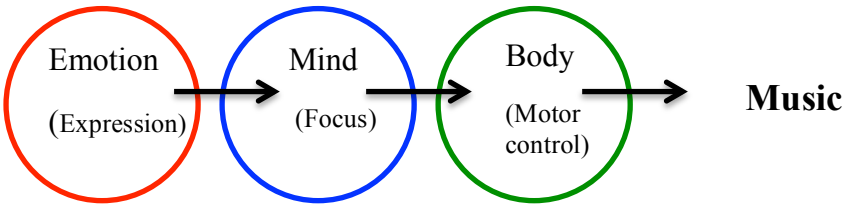


Figure 0.4. A model showing how emotion (in the form of musical expression) is informing the mind (in the form of focus) which in turn informs the body's movements (motor control).

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