

Imaging Mastery: Applying the PETTLEP  
model of imagery to music performance  
practice

Elliott Folvig

Submitted in partial fulfilment of the requirements for the degree of  
Master of Music Performance by Research

November 2011

Faculty of the VCA & Music, The University of Melbourne

## Abstract

Imagery is widely reported as a tool used by elite performers to improve their performance. Despite this, there is little clear information about the integration of imagery into music performance practice. A review of the research in this area reveals that the term *imagery* is an extremely broad description of the ways that mental imagery is used in almost any area or performance. In this paper I have selected a specific approach, the PETTLEP model of motor imagery rehearsal that is aimed at one specific area of performance, motor imagery. The PETTLEP model is based on an understanding, from research in neuroscience, of how the brain works in relation to motor imagery. After applying the model to music performance practice, a number of findings emerged. The model is well suited for the demands of music performance practice and had a positive effect on performance outcomes. There also emerged ways in which further use of the journaling and analysis method may be improved. The clarity and successful application of this model demonstrates that it would be possible to develop specific approaches to mental imagery in music performance practice.

## Declaration

This is to certify that

- The thesis comprises only my original work
- Due acknowledgement has been made in the text to all other material used
- The thesis is between 10,000 and 15,000 words in length, inclusive of footnotes, but exclusive of tables, maps, bibliographies and appendices

## Acknowledgements

I am deeply grateful to the many people who supported me throughout this course. There have been many small conversations and contributions that have proved invaluable – too many to mention. However, I would like to especially thank my fellow students, Convenor of Post-Graduate studies Dr. Donna Coleman and my thesis supervisor Dr. Rob Vincs who have shared the journey from day one. I would also like to pay thanks to my other lecturers, Dr. Kevin March, and John McCaughey who have introduced me to a new and fascinating world of which I hope to become a permanent member. Finally, this journey would simply have been virtually impossible without the ongoing encouragement of my dear friends Ben Chessell and Tim Curtis and would have been worth little were it not for the loving and inspiring support of my partner Kate.

## Table of Contents

Abstract.....	ii
Declaration.....	iii
Acknowledgements.....	iv
Chapter 1: Introduction .....	1
Chapter 2: Context.....	5
Chapter 3: Literature Review .....	9
The PETTLEP model for motor imagery.....	22
Chapter 4: Methodology .....	28
Chapter 5: Discussion.....	33
Chapter 6: Conclusion .....	44
Coda .....	48
Appendix A – Journal Entries .....	54
Appendix B – Journal Scores .....	85
Appendix C – Before and After DVD .....	86

## Chapter 1: Introduction

As a practicing musician, I am constantly refining the methods and techniques in my performance practice as I seek a higher level of musical mastery. One approach I use is to examine the performance and practice techniques of elite performers. In pursuing this method, I have identified the notion of 'imagery' as being a commonly used means of training by many elite musical performers.

My first step in exploring 'imagery' is to define exactly what I am referring to when I use the word imagery.

The human mind is a slide projector with an infinite number of slides stored in its library, an instant retrieval system and an endlessly cross-referenced subject catalogue. As your eyes read these words you can easily see your bedroom in your mind, go to your bed and turn back the covers. In another instant you can sit behind the wheel of your car in traffic. Then you can be in your office looking through a file drawer. And now in a supermarket pushing a shopping cart up to the checkout stand; finally walking down a windswept, deserted beach last summer. You can move from image to image as rapidly as you read. You can 'see' any part of your life effortlessly as often as it is suggested to you.<sup>1</sup>

When we imagine ourselves doing something in our minds, this is what we might call visualisation, or imagery. Anecdotal evidence suggests there is great variety in exactly what occurs when a person visualises. For example, a dream is a type of visualisation. People report many different experiences in dreams. Sometimes a dream may be vivid, colourful, multi-sensory and realistic. Other times dreams may consist of a vague impression in black and white, as a cartoon; the variations are limited only by the human imagination. Remembering an event is also a kind of visualisation. This could be anything that you have ever experienced in your life. But imagery is not limited to

---

<sup>1</sup> Mike and Samuels Samuels, Nancy, *Seeing with the Mind's Eye: The History, Techniques and Uses of Visualization* (New York: Random House, 1975).

reality. You can also imagine yourself in situations that have never, or could never, occur. Most people have imagined some kind of situation in which they are able to do something that in reality they cannot. Any of these internal experiences can be described as a form of imagery.

One of the problems we encounter when bringing anything from our inner world into the outer world is language. Neuroscientist Ian Robertson writes that we are trapped in a 'cool web of language' and that it keeps us from fully using our sensory capabilities to interact with the world. He considers the evolution of language and how we came to our current state in which "Western societies have largely lost the ability to think in images rather than words."<sup>2</sup> The power of visualisation, in all its sensory manifestations, is a lost art.

Musician and educator Eloise Ristad agrees. "Words. How easy it is to get lost in words. How often we drown in words when we try to describe even the simplest instructions or procedures."<sup>3</sup> Music exists in the outer world but has a profound influence on our inner lives as well.

Imagery is more a category than a specific process. Although the word *image* is the root of imagery, it can refer to all of the senses, not only sight. Visualisation, also tending toward vision etymologically, can refer to any or all of the senses in an imagined event. In this paper I will use the words imagery and visualisation to refer to the same process.

The question I am asking regarding imagery is this: how can I incorporate imagery into my performance practice for effective results?

Scientific research into effective imagery has been more prolific in the last twenty years than ever before. In particular, the area of sports performance has had more research conducted in the effects of imagery than any other. In any sport the development of fundamental skills can take years to advance to an elite level that, once achieved, allows other factors such as the tactics of

---

<sup>2</sup> Ian Robertson, *The Mind's Eye* (London: Transworld Publishers, 2003).

<sup>3</sup> Eloise Ristad, *A Soprano on Her Head: Right -Side-up Reflections on Life and Other Performances* (Real People Press, 1982).

the game or personal psychology to play a part in deciding who will attain elite levels of performance. This path is reflected in the development of musicians. The demands of sports performance are in many respects similar to the demands of musical performance. With considered adaptation some of the research into sports performance could be applied to music performance.

From my research into the current literature I have tried to identify an effective, evidenced based approach to imagery rehearsal that is appropriate to my performance practice needs as a guitarist. To narrow the scope of this research I have chosen to target technical development.

In 2001 Paul Holmes and David Collins published "The PETTLEP approach to imagery: a functional equivalence model for sports psychologists."<sup>4</sup> The PETTLEP model (physical, environment, task, time, learning, emotion and perspective) proposes a method that is based on cognitive neuroscience understandings that relate directly to the process of imagery, specifically motor-imagery. One of the key factors in imagery rehearsal suggested by PETTLEP is the importance of functional equivalence; the idea that mental rehearsal is more beneficial the more it involves the same conditions that actual physical performance would involve.

By using a checklist of factors that can potentially be adapted to the specific nature of the imagery undertaken, the PETTLEP model is versatile and evidence based in a way that may be successfully adapted to the demands of musical performance practice. I will apply this method in learning to play Etude No.1 by Villa Lobos for classical guitar.<sup>5</sup>

PETTLEP is based on fairly recent understandings in neuroscience. To the best of my knowledge this information has not previously been used as a basis for music performance practice. If efficacious, this area of neuroscience

---

<sup>4</sup> Paul S. and Collins Holmes, David J, "The Pettlep Approach to Imagery: A Functional Equivalence Model for Sports Psychologists," *Journal of Applied Sport Psychology* 13, no. 1 (2001).

<sup>5</sup> Heitor Villa-Lobos, *Etude No.1* (New York: Associated Music Publishers Inc., 1953).

might be further explored to see if other insights can be effectively adapted for music performance practice application.

Using a phenomenological approach I have recorded observations and events that occurred during practice of a piece of music with the PETTLEP model. The themes that arose over this period have been analysed and discussed and conclusions to the following have been reached:

1. Is the PETTLEP model suitable as a music performance practice tool?
2. What has been the effectiveness on my performance and how has this manifested?
3. What themes and thought processes of my own have emerged?
4. What further methodological refinement could I undertake to gain more effective results using this approach?

In Chapter 2 I will discuss the personal journey that has led to this research. I will also outline some of the current perspectives on using imagery as a performance practice tool.

In Chapter 3 I take the discussion of imagery further by reviewing relevant studies from research literature on imagery, especially from sports performance research. I will also examine the PETTLEP model of imagery rehearsal that was adapted for this paper, in depth.

In Chapter 4 I provide an account of the methodology of my research for the period of performance practice, and in analysing the results of the data it generated.

In Chapter 5 I will discuss the themes that emerged as a result of the research.

Finally, Chapter 6 will conclude with how effective the application of PETTLEP to music performance practice has been, and what further directions in research might be explored.

## Chapter 2: Context

### Personal context for the study

My first experience of visualisation as a learning tool, that I can recall, occurred when I was about 11 years old. My drama teacher introduced us to progressive relaxation where we visualised each part of our body sinking into the floor as we lay still. I remember being amazed that I really felt like I was below the level of the floor. This vivid experience stayed with me but I never explored visualisation any further.

As a professional musician I also came across the term visualisation in a few books directed at improving performance practice. But in all of them it is assumed imagery is something you just do; how you do it was never detailed.

Sports imagery research has found a similar situation.

Hall, Rodgers, and Barr (1990) reported that athletes have little understanding of how to use imagery. They cite as examples the unsystematic way in which imagery is employed and its use primarily in association with competition.<sup>6</sup>

I noticed some differences between the ways a musician uses imagery and how athletes use imagery. I had observed musicians told to lie down and close their eyes to become as relaxed as possible to enter into imagery. Whereas I had observed sprinters, for example, out on the track using imagery as they went through the actual steps of their race, sometimes slowly, but also at top speed. This raised a question in my mind: is the use of imagery different for athletes than it is for musicians? During the course of this research, it became clear that the term 'imagery' is a broad description of a whole class of mental activities and that I had observed two varieties that, while both come under the category of imagery, are very different in both method and application.

---

<sup>6</sup> Ibid. 61.

A number of music educators have considered visualisation an important practice tool. Eloise Ristad tries to describe the multi-sensory perception required with the phrase 'feeling sense' and narrates a few stories as examples.<sup>7</sup> Her descriptions are certainly of successful imagery use, but the variety of things she describes – a student 'hears' a finished composition; a pianist 'imagines' a difficult phrase executed perfectly; a dancer 'moves' more effortlessly – are such different applications of imagery that it is confusing to someone who does not already know the experience that she is trying to convey.

Imagery, or visualisation, seems to be most often used in the form traditionally associated with therapy - lying down, eyes closed and relaxed. While this type of imagery has been shown to achieve positive results, it is critical to specify what the purpose of the imagery is. For dealing with anxiety this approach may be well suited, but for imagery intended to develop motor skills this approach contradicts current research. The difference between these two approaches is akin to the difference I had perceived in imagery use by musicians and athletes.

One author who has attempted a more systematic approach to a useable methodology for musicians is Mulva Freymuth. In her book *Mental Practice and Imagery for Musicians: A Practical Guide for Optimizing Practice Time, Enhancing Performance, and Preventing Injury*,<sup>8</sup> Freymuth presents a more systematic method of integrating imagery into musical performance practice. She has employed much from sports psychology research into her approach, and her experience as a musician and educator help to make this method applicable to performance practice. The critical difference between her method and the PETTLEP model of imagery rehearsal is the degree of functional equivalence prescribed. Her book was published in 1999, before the research that suggests functional equivalence is a vital component in

---

<sup>7</sup> Ristad, *A Soprano on Her Head: Right -Side-up Reflections on Life and Other Performances*.

<sup>8</sup> Malva Freymuth, *Mental Practice and Imagery for Musicians: A Practical Guide for Optimizing Practice Time, Enhancing Performance, and Preventing Injury* (Boulder: Integrated Musician's Press, 1999).

motor imagery rehearsal. The emphasis on this factor in the PETTLEP model is an important step in the evolution of imagery rehearsal methodology. (Functional equivalence is dealt with in greater detail in the Chapter 3 Literature Review).

Musicians have a number of physical and theoretical skills to learn as they develop their performance practice. For any musical style, it is not difficult to find out what one should learn in order to master the idiom; there are countless books and other resources available. But how we go about acquiring and honing these skills is far more complicated, as it requires that you actually learn. By refining the processes involved in learning, we are developing tools that can be applied to any learning requirements. Imagery could be equally applicable to developing speed or understanding music theory. The better the process is understood, the more specific adaptations can be made for the task at hand.

Using emerging understanding about how we learn, from research in cognitive neuroscience, new approaches to learning are being proposed, such as the PETTLEP model for imagery rehearsal. By adapting this model for use in my own performance practice, I hope to illuminate and refine the use of imagery as an effective practice tool, and to demonstrate whether the PETTLEP model is an appropriate method for music practice.

Currently, imagery rehearsal in music performance practice has something of a 'one size fits all' mentality. Based in its therapeutic past, the common approach is to relax, often to lie down, and close your eyes in order to focus on imagery rehearsal. But with a method such as PETTLEP it is clear that the specific nature of what is being rehearsed should determine these aspects for any imagery rehearsal session, in order to achieve the most effective results.

New research in neuroscience can influence any area of human activity as it deals directly with the inner workings of the brain. By employing a technique that has evolved from such research, this paper demonstrates that any approach to performance practice needs to be continuously refined, as clearer understanding of how our minds function emerges. To the best of my knowledge, the PETTLEP model has not previously been applied to music

performance practice.

## Chapter 3: Literature Review

The literature that informs this paper is drawn from imagery research in sports performance, music performance and neuroscience. Some findings are activity specific while others have broader implications. In this chapter I will give a 'dot-point' summary of the relevant key research findings and then discuss in more detail significant themes that emerge. The specific model I have chosen to apply in my research practice, PETTLEP, is discussed in depth at the end of the chapter.

Research summaries:

1983 – Feltz and Landers. "The effect of imagery on motor skill learning and performance: A meta-analysis."<sup>9</sup>

Findings:

- Mental practice is somewhat better than no practice
- Mental practice is more effective in cognitive tasks rather than motor or strength tasks
- Proposition 1: Mental practice effects are primarily associated with cognitive-symbolic rather than motor elements of the task
- Proposition 2: Mental practice effects are not just limited to early learning - they are found in early and later stages of learning and may be task specific
- Proposition 3: It is doubtful that mental practice effects are produced by low-gain innervation of muscles that will be used during actual performance
- Proposition 4: Mental practice functions to assist the performer in psychologically preparing for the skill to be performed

1994 – Driskell et al. "Does Mental Practice Enhance Performance."<sup>10</sup>

---

<sup>9</sup> Deborah and Landers Feltz, Daniel, "The Effect of Imagery on Motor Skill Learning and Performance: A Meta Analysis," *Journal of Sports Psychology* 5(1983).

## Findings:

- Clear consensus is precluded due to (a) lack of consistent definition and (b) empirical results are inconclusive
- Mental practice has a positive and significant effect on performance
- Effectiveness is moderated by type of task, interval between practice and performance and duration of mental practice
- Definition: "Mental practice is the symbolic, covert, mental rehearsal of a task in the absence of actual, overt, physical rehearsal."
- Task type: "Mental practice is effective for both cognitive and physical tasks; however, the effect of mental practice is significantly stronger the more a task involves cognitive elements."
- Retention: "The longer the delay between practice and performance, the weaker the effects of mental practice on performance."
- Previous experience: "Experienced subjects benefit equally well from mental practice, regardless of task type. Novice subjects benefit more from mental."
- Duration of session: "A practical guideline for implementing mental practice suggests an overall training period of approximately 20 min."
- Results 1: "The results of this analysis indicate that mental practice is an effective means for enhancing performance. However, the data also indicate that mental practice is less effective than overt, physical practice."
- Results 3: "After approximately 2 weeks, the beneficial effects of mental practice have been reduced to one-half of their original magnitude, and after approximately 3 weeks, the increase in performance due to mental practice has substantially dissipated."
- "To gain the maximum benefits of mental practice, one should implement refresher training on at least a 1- to 2-week schedule."

---

<sup>10</sup> James; Copper Driskell, Carolyn; Moran, Aidan, "Does Mental Practice Enhance Performance," *Journal of Applied Psychology* 79, no. 4 (1994).

1998 – White and Hardy. “An In-Depth Analysis of the uses of Imagery by High Level Slalom Canoeists and Artistic Gymnasts.”<sup>11</sup>

Findings:

- Wide range of imagery uses
- Uses reflected cognitive and motivational effects of imagery on performance
- Gymnasts and canoeists reported using imagery for cognitive functions
- Sport specific applications
- Gymnasts used imagery to perfect/comprehend skills; canoeists used generally to anticipate scenarios and more explicitly when rehearsing difficult skills
- Frequent use in enhancing concentration (and therefore quality) of training
- Use in competition to block out distraction and to review past performances
- Used by both for skills, routines and courses
- Canoeists review imagery between runs (their sport allows the best of 3 runs); gymnasts don't (one attempt only)
- Canoeists use imagery to improve automation (this seems counter to in the moment reactions, but imagery is based on implicit knowledge)
- Once a layout was known, verbal knowledge was turned into procedural rehearsal to help automation
- Motivational use was universal, such as receiving awards etc, and for explosive energy in certain actions
- Self-confidence is universal; success is determined by the outcome of the imagery (whether they see themselves succeed/fail). This supports the notion than “imagery allows the athlete to gain vicarious or imagined experience.”

---

<sup>11</sup> Alison and Hardy White, Lew, "An in-Depth Analysis of the Uses of Imagery by High Level Slalom Canoeists and Artistic Gymnasts," *The Sport Psychologist* 12, no. 4 (1998).

- This impact on self-confidence highlights the danger of using uncontrolled imagery
- Both sports reported use of imagery to control anxiety in various situations
- Half reported simulating competition; those that did said it helped recreate the emotional situation of performance
- Used more in competition than in training
- Coach encouragement strongly influenced any imagery use outside of training
- All reported more imagery should be used in training; this emphasises the education of athletes and coaches about imagery usage
- Sports specific education should be a focus in this education
- It is suggested sports psychologists should work with individual athletes to understand their imagery syntax and refine it for their particular requirements

2002 – Cumming and Hall. “Deliberate imagery practice: the development of imagery skills in competitive athletes.”<sup>12</sup>

Findings:

- PETTLEP-based imagery interventions were more effective than traditional imagery
- The intervention most strongly aligned with the PETTLEP model, proved the most effective
- Participants were in the position in which they actually performed the task; this may be significant
- PETTLEP imagery appeared to be as effective as physically performing the task
- The effect of using this model “in the field” may be even more dramatic than indicated by these results
- The usefulness of the PETTLEP model is not constrained to any

---

<sup>12</sup> Jennifer; Hall Cumming, Craig, "Deliberate Imagery Practice: The Development of Imagery Skills in Competitive Athletes," *Journal of Sports Science* 20(2002).

particular age group, level of experience, or sporting task

- The PETTTLEP model may be of benefit in a wide variety of sports
- The studies also showed that PETTTLEP imagery was effective with both novice and experienced performers
- It may be more beneficial to athletes to wear the correct clothing and hold any sporting implements used when performing their imagery, to provide a greater functional equivalence and therefore have the greatest effect on performance

2007 – Wright and Smith. “The Effect of a Short-term PETTTLEP Imagery Intervention on a Cognitive Task.”<sup>13</sup>

Findings:

- By increasing the functional equivalence, the positive effect on performance is also increased
- The physical practice group did improve from pre-test to post-test, it was not significantly more effective than the PETTTLEP imagery group
- The results of the study support the PETTTLEP model when it is used over a short period on a cognitively based task
- The employment of this model as part of a pre-performance routine is also advantageous, as elements of the PETTTLEP model, such as environment, would be easier to include into the imagery, as the performer would already be at the venue. The physical and emotion components would also be partly accounted for, as it is likely that the athlete would already be dressed in the correct clothing and experiencing some of the emotions associated with their immediately subsequent performance

2007 – MacIntyre and Moran. “A Qualitative Investigation of Meta-Imagery Processes and Imagery Direction among Elite Athletes.”<sup>14</sup>

---

<sup>13</sup> Caroline J. and Smith Wright, Dave, "The Effect of a Short-Term Pettlep Imagery Intervention on a Cognitive Task," *Journal of Imagery Research in Sport and Physical Activity* 2, no. 1 (2007).

#### Findings:

- Elite performers showed evidence of sophisticated meta-imagery control skills
- The most frequently reported applications of imagery related to cognitive functions
- Motivational aspects of imagery were not as relevant to our sample of elite performers as they appear to have been in previous studies using non-elite samples
- Elite sample's experience of imagery direction seems to be more complex than had previously been believed
- Imagery was employed for skill acquisition, skill maintenance and to generate creative solutions

2007 - Smith et al; "It's all in the mind: PETTLEP-based imagery and sports performance."<sup>15</sup>

#### Findings:

- PETTLEP was significantly more effective than no imagery (more than double)
- PETTLEP was virtually equal to physical practice
- Usefulness not constrained by age, experience, or task
- Wearing clothes or holding tools required in the actual task improve the effectiveness of PETTLEP imagery
- In lieu of being in the performance space itself, use of video (or any other means) to improve the Environment component of PETTLEP increase effectiveness

---

<sup>14</sup> Tadhg; Moran MacIntyre, Aidan P., "A Qualitative Investigation of Meta-Imagery Processes and Imagery Direction among Elite Athletes," *Journal of Imagery Research in Sport and Physical Activity* 2, no. 1 (2007).

<sup>15</sup> Dave; Wright Smith, Caroline; Allsopp, Amy; Westhead Hayley, "It's All in the Mind: Pettlep-Based Imagery and Sports Performance," *Journal of Applied Sports Psychology* 19(2007).

2009 – Wright and Smith. “The effect of PETTLEP imagery on strength performance.”<sup>16</sup>

Findings:

- The combination group (PETTLEP/physical) improved more than the PETTLEP imagery group and marginally more than the physical practice group
- PETTLEP, combination, and physical groups improved, whereas traditional and control groups did not
- More attention to kinesthetic functional equivalence produced greater improvements than visual imagery

2009 – Ramsey et al. “Examining the Emotion Aspect of PETTLEP-based Imagery with Penalty Taking in Soccer.”<sup>17</sup>

Findings:

- Use of Emotion in visualization may be more effective in competitive situations than practice situations

## Emerging themes

### *1. Most effective on cognitive tasks*

There are a number of studies that have found that the effectiveness of mental rehearsal is greater for tasks requiring a higher degree of cognitive processing. In the 1983 meta-analysis, Feltz and Landers proposed that, “Mental practice effects are primarily associated with cognitive-symbolic rather than motor elements of the task.”<sup>18</sup> Driskell et al in a later study qualify this suggestion. “Mental practice is effective for both cognitive and physical tasks; however, the effect of mental practice is significantly stronger the more a task

---

<sup>16</sup> Caroline J. and Smith Wright, Dave, "The Effect of P E T T L E P Imagery on Strength Performance," *International Journal of Sport and Exercise Psychology* 7(2009).

<sup>17</sup> Richard; Cumming Ramsey, Jennifer; Edwards, Martin; Williams, Sarah; Brunning, Chris, "Examining the Emotion Aspect of Pettlep-Based Imagery with Penalty Taking in Soccer," *Journal of SPort Behaviour* 33, no. 3 (2009).

<sup>18</sup> Feltz, "The Effect of Imagery on Motor Skill Learning and Performance: A Meta Analysis." 45.

involves cognitive elements.”<sup>19</sup> This identifies mental rehearsal as multifarious in its potential application, but highlights the particular potential when applied to complex cognitive tasks.

This is reflected in reports from elite performers themselves. In studying the uses of imagery by gymnasts and canoeists, White and Hardy found clear examples of the specific use of imagery for cognitive tasks, “Participants reported using imagery in a variety of different environments for cognitive and motivational purposes.”<sup>20</sup>

All of these studies also indicate mental rehearsal is effective in the physical results achieved; some studies have found it equal to physical rehearsal. In research involving the effectiveness of short-term imagery rehearsal on participants playing computer games Wright and Smith found that “PETTLEP was as effective as physical practice.”<sup>21</sup>

The significance of these findings to this paper is that mental rehearsal in music performance practice involves constant cognitive input and negotiation. Emotions, interactions with the audience, the environment, and other musicians (in ensemble playing) are just a few of the factors constantly at play during musical performance. Research has consistently concluded that imagery is an effective rehearsal technique, especially for cognitively demanding tasks, such as music performance.

## *2. Variety of mental practice effects*

The number of different areas to which imagery has been applied is vast.<sup>22</sup> Imagery can be used at various stages of learning and the evidence suggests that there is equal benefit for novice and experienced performers. Feltz and Landers second proposition is, “Mental practice effects are not just limited to

---

<sup>19</sup> Driskell, "Does Mental Practice Enhance Performance." 485.

<sup>20</sup> White and Hardy, "An in-Depth Analysis of the Uses of Imagery by High Level Slalom Canoeists and Artistic Gymnasts," 396.

<sup>21</sup> Wright and Smith, "The Effect of PETTLEP Imagery on Strength Performance," 28.

<sup>22</sup> Samuels, *Seeing with the Mind's Eye: The History, Techniques and Uses of Visualization*.

early learning—they are found in early and later stages of learning and may be task specific.”<sup>23</sup>

There are reports by master musicians that they continue to use mental rehearsal, in some cases increasingly, throughout their career.<sup>24</sup>

Exploring the use of imagery in elite sports, White and Hardy questioned gymnasts and canoeists. There is considerable cross over in the application of imagery in both sports, even though they require vastly different physical skills. For example, self-confidence is a universal target of imagery; success is determined by the outcome of the imagery i.e. whether they see themselves succeed or fail in the imagery.

Elite performers can use imagery extremely skilfully and learn to apply it in ways not immediately obvious. “Elite performers in our study showed evidence of sophisticated meta-imagery control skills – being able, for example, to restructure negative imagery so that it facilitates future performance.”<sup>25</sup> This same study also reported that the sophistication with which these elite athletes were using mental imagery was far more advanced than previously thought.

### *3. Moderators on effectiveness of imagery*

There have been a number of moderators reported that influence the effectiveness of mental imagery. Some of these observations are very helpful in formulating a performance practice schedule of imagery rehearsal. “Effectiveness is moderated by type of task, interval between practice and performance and duration of mental practice.”<sup>26</sup>

---

<sup>23</sup> Feltz, "The Effect of Imagery on Motor Skill Learning and Performance: A Meta Analysis." 46.

<sup>24</sup> Freymuth, *Mental Practice and Imagery for Musicians: A Practical Guide for Optimizing Practice Time, Enhancing Performance, and Preventing Injury*.

<sup>25</sup> MacIntyre, "A Qualitative Investigation of Meta-Imagery Processes and Imagery Direction among Elite Athletes." Abstract.

<sup>26</sup> Driskell, "Does Mental Practice Enhance Performance." 485.

“The longer the delay between practice and performance, the weaker the effects of mental practice on performance.”<sup>27</sup> This is a very useful practical finding. In order to include mental rehearsal in any performance practice routine, we need to account for the timeframe between when the task is rehearsed and when the task is required to be performed, for optimal effectiveness.

“A practical guideline for implementing mental practice suggests an overall training period of approximately 20 min.”<sup>28</sup> A finding this specific makes the inclusion of mental imagery in a practice schedule far more measurable and manageable.

“To gain the maximum benefits of mental practice, one should implement refresher training on at least a 1- to 2-week schedule.”<sup>29</sup> This is another important factor for designing an effective imagery rehearsal routine.

There are also findings that relate the damage unstructured or misdirected imagery can cause to self-confidence and the implications for this on performance.

If the imaged performance was unsuccessful, the information supplied by the image would be negative and would therefore decrease self-efficacy (Woolfolk, Parrish, & Murphy, 1985). The influence of imagery controllability on self-confidence highlights the importance of imagery practice and the potential dangers of using uncontrolled imagery.<sup>30</sup>

In the study of high-level canoeists and gymnasts by White and Hardy, self-confidence is universal; success is determined by the outcome of the imagery i.e. whether they see themselves succeed or fail. This supports their contention that “imagery allows the athlete to gain vicarious or imagined

---

<sup>27</sup> Ibid.

<sup>28</sup> Driskell, "Does Mental Practice Enhance Performance." 485.

<sup>29</sup> Ibid.

<sup>30</sup> White and Hardy, "An in-Depth Analysis of the Uses of Imagery by High Level Slalom Canoeists and Artistic Gymnasts," 400.

experience.”<sup>31</sup> In relation to this paper, this finding has potential application in the use of imagery to deal with performance anxiety.

#### *4. PETTLEP vs. physical vs. combined vs. traditional imagery*

In Feltz and Landers 1983 meta-analysis they found that mental practice is effective as a means for enhancing performance. They also indicated that mental practice is less effective than overt physical practice.<sup>32</sup>

This finding is contradicted by a number of other studies. A study of gymnasts and hockey players found, “Both the physical practice and PETTLEP groups improved significantly from pre-test to post-test, with no significant difference between them.”<sup>33</sup> Also, in a study of short term imagery effects on computer game performance, “Contrary to previous studies, PETTLEP was as effective as physical practice.”<sup>34</sup>

Further evidence has suggested that combining PETTLEP imagery rehearsal and physical practice is actually more effective than an equivalent amount of time spent fully on physical practice. In a 2009 study of the effects on strength performance of traditional imagery, PETTLEP, physical practice and a combined group of physical and PETTLEP imagery, “The combination group improved significantly more than the PETTLEP imagery group and marginally more than the physical practice group.”<sup>35</sup>

The functional equivalence of this study is important to this paper as it used a method of functional equivalence very similar to my own practice sessions.

The PETTLEP imagery group performed their imagery while sitting at the bicep curl machine, in the gym where the pre-test took place. This

---

<sup>31</sup> Ibid.

<sup>32</sup> Feltz, "The Effect of Imagery on Motor Skill Learning and Performance: A Meta Analysis." 26.

<sup>33</sup> Smith et al., "It's All in the Mind: Pettlep-Based Imagery and Sports Performance," 80.

<sup>34</sup> Wright and Smith, "The Effect of PETTLEP Imagery on Strength Performance," 28.

<sup>35</sup> Ibid.

ensured that the environment factor of the PETTLEP model was accounted for, as the sounds, visual stimuli, and smell of the gym during the interventions were identical to those that the participants experienced during the pre-test. The participants were also encouraged to hold the handles on the machine to ensure functional equivalence of haptic sensations.<sup>36</sup>

In my practice I sat in performance posture with my instrument in my hands exactly as it would be in a performance situation. Another study cites the positive benefits of using imagery in the most equivalent setting possible.

It may be more beneficial to athletes to wear the correct clothing and hold any sporting implements used when performing their imagery, to provide a greater functional equivalence and therefore have the greatest effect on performance.<sup>37</sup>

##### *5. Competition vs. training*

Most athletes reported using imagery more often in competition than in training. Primarily they use it for motivation, focus and to review performances (this last point depends somewhat on the nature of the discipline).<sup>38</sup>

When used in training situations some testimonies indicate that it helps to recreate the emotional situation of performance. There is also mention that both athletes and coaches believe more imagery should be used during training, "All athletes reported that imagery was an important part of their psychological preparation and that more time should be spent on imagery during training."<sup>39</sup>

---

<sup>36</sup> Wright and Smith, "The Effect of PETTLEP Imagery on Strength Performance," 28.

<sup>37</sup> Smith, "It's All in the Mind: Pettlep-Based Imagery and Sports Performance." 90.

<sup>38</sup> White, "An in-Depth Analysis of the Uses of Imagery by High Level Slalom Canoeists and Artistic Gymnasts." 400.

<sup>39</sup> Ibid.

Comparing athletes performing at higher levels with those at lower levels, the higher performing athletes believe imagery is more important to successful performance and they also reported having employed imagery more often over their careers than athletes performing at lower levels.

National athletes perceived imagery to be more relevant to performing than recreational athletes. In addition, athletes of a higher standard (i.e. provincial and national) reported using more imagery in a recent typical week and they had accumulated significantly more hours of imagery practice across their athletic career than recreational athletes.<sup>40</sup>

This prevalence among leading performers of consistent imagery use is important to this paper in justifying imagery as a vital requisite in acquiring elite performance skills.

#### *6. Sport/task specific*

The specific skill being imaged requires consideration of its unique demands. Any imagery rehearsal is designed and adjusted to meet these needs.

Imagery was often determined by the particular demands of each sport. Using Pavio's (1985) terminology, gymnasts reported that imagery was used most frequently at the cognitive level to rehearse specific skills and difficult moves in training and competition. In these cases, imagery was used to understand the technical demands or perfect specific details of movement skills. In contrast, slalom canoeing required imagery use at a cognitive level to rehearse difficult moves, and at a general one to formulate and rehearse potential movement plans through slalom courses.<sup>41</sup>

White and Hardy also offer some suggestions to sports psychologists.

---

<sup>40</sup> Cumming, "Deliberate Imagery Practice: The Development of Imagery Skills in Competitive Athletes." 137.

<sup>41</sup> White, "An in-Depth Analysis of the Uses of Imagery by High Level Slalom Canoeists and Artistic Gymnasts." 401.

(They) should work with individuals to establish a detailed account of their imagery use and experience in different sport situations. Gaining insight into the meaning of images from the athlete's perspective would enable the sports psychologist to provide athletes with advice and support more effectively.<sup>42</sup>

This paper aims, through the use of a method based on neuro-scientific research, the PETTLEP approach to motor imagery, to offer a performer an effective approach to account for these factors in their own performance practice

### The PETTLEP model for motor imagery

2001 – Holmes and Collins, "The Pettlep Approach to Imagery: A Functional Equivalence Model for Sports Psychologists."<sup>43</sup>

PETTLEP is proposed as a solution to problems identified with existing motor imagery practices. Holmes and Collins state the perceived problems with current practices.

Our concern with the current state of theory-based imagery application stems from two areas: (a) from consideration of research design and application, and (b) from theoretical weaknesses.<sup>44</sup>

The core problem is that "none of the theories common in the sport psychology literature have been subjected to rigorous study and therefore do not represent comprehensive theories based on underlying mechanisms."<sup>45</sup> The result is slipshod application of poorly understood mechanisms.<sup>46</sup>

With PETTLEP, Holmes and Collins propose a theory of motor imagery based

---

<sup>42</sup> Ibid. 401.

<sup>43</sup> Holmes, "The Pettlep Approach to Imagery: A Functional Equivalence Model for Sports Psychologists." 61.

<sup>44</sup> Ibid.

<sup>45</sup> Ibid.

<sup>46</sup> Ibid.

on research in neuroscience. The central aim of PETTLEP is, therefore, to provide a motor imagery model based on the underlying cognitive neuroscience processes.

The paper will propose that, while motor imagery's effectiveness in improving performance is clearly multifarious, many of these factors seem to have fundamental links to the physical task when imagery is successful.<sup>47</sup>

### *The neurological reasoning behind PETTLEP*

Citing various studies, Holmes and Collins make the contention that at a fundamental level the brain processes imagery and physical action of a motor task, at least initially, from the same cognitive representation.

If, as this paper will support, motor imagery and motor preparation and execution are related to the same motor representation system (Decety & Grèzes, 1999), then consideration of the two processes and the extent to which they covary (their functional equivalence), is vital if motor imagery is to be optimally used as a successful tool in sport psychology (see Jeannerod, 1999, for a comprehensive review of such issues). The fundamental point for applied sport psychology is that, if physical and mental practices are equivalent, then many of the procedures shown to be efficacious in physical practice should also be applied in mental practice as well.<sup>48</sup>

The cognitive neuroscience considered falls into two main areas. The first is during the cognitive steps to action, or preparation (intention, planning and programming) before execution. The second concerns the topology (where) and typology (what kind) of brain activity are involved in motor imagery.

---

<sup>47</sup> Holmes, "The Pettleple Approach to Imagery: A Functional Equivalence Model for Sports Psychologists." 62.

<sup>48</sup> Ibid.

Part of the cognitive evidence is based on examination of the imagery processes in hemiplegic, paraplegic and quadriplegic patients. The time it takes a subject to complete a task mentally is compared with the time it would take to complete the same task physically. Using imagery, the hemiplegic patients visualised their paralyzed limb performing a task then, with their healthy limb, they actually performed the task. Their mental times were significantly slower than their physical times; whereas, paraplegic and quadriplegic patients' imagery times were equivalent when compared to a physical control group. This suggests the injury to cortical areas interferes with imagery, but injury to spinal areas does not. "The high level motor processes, presumably sited cortically, of motor preparation and execution, interact with the representation for motor imagery and covariance is only reduced when cortical areas are disrupted."<sup>49</sup>

The topology and typology evidence comes from observing which parts of the brain are active during imagery and physical tasks. "A significant proportion of cortical area, therefore, shows a pattern of activity during motor imagery similar to that of actual performance."<sup>50</sup> One possibly more important implication is the finding that brain activity changes due to the specific task being imagined.

While motor imagery was found to activate various brain regions, a potentially more significant finding was that brain activity is influenced by the nature of the imaginal task (Jeannerod & Decety, 1995).<sup>51</sup>

These and other studies provide strong support for comprehensive consideration of the sport skill being imaged at any given moment in time, matching any attentional "switches" as the skill proceeds, and modifying imagery scripts to consider the effects of learning on the

---

<sup>49</sup> Holmes, "The Pettlep Approach to Imagery: A Functional Equivalence Model for Sports Psychologists." 62.

<sup>50</sup> Ibid., 63.

<sup>51</sup> Ibid., 64.

task.<sup>52</sup>

For musicians this insight is critical. In a single passage of music the physical demands can vary tremendously; so must an imagery script for rehearsing such a passage.

What is clear from this research is that the cortical and sub-cortical areas active during motor imagery pertain to neural networks known to be involved in at least the early stages of motor control (Decety, 1996b). This supports the argument for common neural mechanisms of motor imagery and motor preparation and execution.<sup>53</sup>

For the purposes of this study a working overview of this research might be this: during the first few stages of performing a physical task, there is essentially no difference between the imagery of the physical action and the physical action.

### *Imagery and consciousness*

There is also evidence that observing a demonstration or video of an activity can increase certain brain functions related to that activity. This relates to the visuo-motor systems in the brain. Ungerleider and Mishkin have proposed that the visuo-motor system is made up of two parts.

The first consists of a ventral stream of projections from the primary visual cortex to the infero-temporal cortex that is associated with perceptual identification and recognition of objects. It has associations with higher order brain areas involved with memory. The second is identified by a dorsal stream terminating in the posterior parietal region having connections directly with the motor areas and linked to spatial perception, later modified to sensori-motor transformations by Goodale and Milner

---

<sup>52</sup> Ibid., 64.

<sup>53</sup> Holmes, "The Pettlep Approach to Imagery: A Functional Equivalence Model for Sports Psychologists." 67.

(1992).<sup>54</sup>

These two streams do not function completely separately but, according to Decety and Grezes, having an explicit outcome for a task can increase this segregation. This supports the idea of goal oriented imagery scripts.

The ventral system output must rise into consciousness to be useful. However, the dorsal system can operate at an unconscious level and keeping the ventral information away may prove more effective.

Information can be processed in the dorsal system without reaching consciousness and that this prevents interference with the perceptual constancies intrinsic to many operations within the ventral system that do result in awareness. Intrusions of viewer-centered information could disrupt the continuity of object identities across changing viewpoints and illumination conditions. If this argument is correct, then there should be occasions when normal subjects are unaware of changes in the visual array to which their motor system is expertly adjusting.<sup>55</sup>

It is therefore plausible that elite performance requires much processing to occur in the dorsal stream. In support of this contention is the common inability, after a successful performance, of elite performers to consciously report visual events.

Musicians may require the interaction of the two streams at different levels of learning. In sight-reading, recognition (ventral) is just as important as physically performing the notes (dorsal). As a piece of music becomes more familiar, muscle memory (dorsal) plays a more important role and may take over once the piece is committed to memory.

Imagery scripts are often used only in light of a conscious process and this is an ineffective use of the information about unconscious interactions.

---

<sup>54</sup> Ibid.

<sup>55</sup> Holmes, "The Pettle Approach to Imagery: A Functional Equivalence Model for Sports Psychologists." 67.

If the representation system is the same, as previously discussed, motor imagery may access the same systems and operate at the unconscious level, in the same way the physical action does. The more strongly this representation system is recruited, i.e. by strengthening the memory trace being accessed, the more these other systems are recruited. So functional equivalence becomes tasked with making the memory traces as strong as possible. The seven categories of PETTLEP outline a method to achieve this.

## Chapter 4: Methodology

### Choosing an appropriate methodology

The purpose of my research is to find a method to help me integrate the effective use of imagery into my musical performance practice. I decided that a phenomenological exploration was the best method for my research as it incorporates both practical and academic analysis of my internal practice methods. I have chosen to use the phenomenological approach outlined by Clark Moustakas in *Phenomenological Research Methods*.<sup>56</sup>

*The PETTLEP approach to motor imagery: a functional equivalence model for sports psychologists*<sup>57</sup> was published in 2001 and suggests a methodical, theoretically sound approach to motor imagery rehearsal. This research is based on understanding the neurological processes related to motor imagery and how to exploit them for most effective use. The method suggests a seven-point checklist when using imagery in order to achieve the highest possible degree of functional equivalence between visualised motor rehearsal and actual motor rehearsal. The seven categories are: physical, environment, task, time, learning, emotion and perspective. While the seven areas are meant to cover as many possible aspects of imagery rehearsal as possible, the authors suggest that any further additions or refinements that are specific to the task being performed should be added to ensure functional equivalence. This must be done on a task-by-task basis as every activity is going to have its own unique requirements.

### Adapting PETTLEP for music performance practice

It is clear that the constant complex cognitive (and sometimes physical) demands of music performance can be effectively rehearsed with imagery.

---

<sup>56</sup> C.E. Moustakas, *Phenomenological Research Methods* (Sage, 1994).

<sup>57</sup> Holmes, "The Pettle Approach to Imagery: A Functional Equivalence Model for Sports Psychologists."

Also, the efficacy of imagery practice is reported to be equally beneficial for beginners and masters alike. A number of leading performers report consistent use of imagery rehearsal.<sup>58</sup>

From my review of relevant research literature, I have identified a number of factors that influence the efficacy of imagery rehearsal.

Some of the moderating effects on imagery effectiveness include: time between rehearsal and performance, length of practice session, and optimum period within which to refresh gains from previous rehearsal. Research has found that a structured approach can help performers integrate imagery into their performance practice. By setting a specific timeframe for the duration of overall practice (one month), each session (20 minutes), and performing the routine daily, all of these factors have been carefully considered and incorporated into the imagery script.

To keep the area of research to a manageable size, I decided to focus on one area of technique and one piece of music. I chose a piece that would focus heavily on the development of right hand control, tone production and speed: Villa-Lobos, *Etude No. 1*.<sup>59</sup>

## Journal structure

I made a video of my performance of the selected piece before the first practice session so I would be able to visually compare any technical developments. I performed the piece three times with a different camera angle each time, to focus on specific parts of my technique. I repeated this process after the thirty practice sessions.

I kept a journal (for thirty practice sessions) and in each entry I outlined my perception of my practice in each of the seven areas of focus.

---

<sup>58</sup> Freymuth, *Mental Practice and Imagery for Musicians: A Practical Guide for Optimizing Practice Time, Enhancing Performance, and Preventing Injury*.

<sup>59</sup> Heitor Villa-Lobos, *Etude No. 1* (New York: Associated Music Publishers Inc., 1953).

After a couple of sessions it became clear that I needed to reorganise my practice to deal with specific components that required individual attention. So I broke the session into two parts. The first part focused on a specific technical aspect involving the right hand, and the second concerned the overall performance of the piece.

After a few more sessions, I felt that comparisons from one day to the next were insufficient so I began giving myself a score out of ten, relating to my perceived level of quality of practice, in each category. The decision to give a numerical value to such a subjective perception helps overcome one of the difficulties of performance practice, namely, how to measure your performance.

## Measurement

One difficulty in performance practice is the question of how to measure improvement. Measurement is critical in order to get the most effective results from an activity. Mihalyi Csikszentmihalyi includes the ability to create measureable goals and feedback as one of the critical steps in the optimal experience state that he calls 'flow'. "Unless a person learns to set goals and to recognize and gauge feedback in such activities, she will not enjoy them."<sup>60</sup> Lack of a clear precise measurement makes management much more difficult.

The subjective nature of art makes judgments difficult to render. Lydia Goehr mentions a medieval form of theological argument that, she says, can be used to make artistic decisions or arguments more definitive.

At it's core was the idea that one can show or point to what cannot be said or known by ordinary means by something that can be said or

---

<sup>60</sup> Mihaly Csikszentmihalyi, *Flow: The Psychology of Optimal Experience* (New York: HarperCollins, 1990).

known by these means...Showing one thing by saying another was the form exemplified in arguments of analogy.<sup>61</sup>

In PETTLEP we have a means of analogy. By identifying elements accepted as important (tempo, dynamics or tone production for example) and focusing our intention on improving these things in ways accepted as improvements (such as comparison with recordings, feedback from ourselves, recordings of practice or from teachers) we have an analogous means of 'measuring' improvement. This would help to satisfy Csikszentmihalyi's rules of flow.

### On Quantifying the Uncountable in Music

In my journal I chose to include a mark out of ten for my perceived level of attainment in each category after each session.

Rudolf Radocy discusses the relevance of assigning a numerical value to a subjective feeling in his article *On Quantifying the Uncountable in Musical Behaviour*.

If "uncountable" but important aspects of performances, programs, and people are to be quantified, music educators must consider subjective feelings, characteristics, recollections, and beliefs, whatever their bases and degrees of abstraction.<sup>62</sup>

He also highlights the incongruity of a numerical scale as a subjective measurement. "Many important aspects of performance and teaching cannot be measured by counting units; human judgments are necessary."<sup>63</sup> The same can be said about judging one's own performance practice.

Radocy considers an oft-cited definition of measurement, "In its broadest

---

<sup>61</sup> Lydia Goehr. *The Quest for Voice: Music, Politics and the Limits of Philosophy*, The 1997 Ernest Bloch Lectures. (Oxford: Oxford University Press, 1998), 19.

<sup>62</sup> Rudolf E. Radocy, "On Quantifying the Uncountable in Musical Behavior," *Bulletin of the Council for Research in Music Education* 88, no. Summer (1986).

<sup>63</sup> Ibid.

sense, measurement is the assignment of numerals to objects or events according to rules."<sup>64</sup> This definition does not restrict measurement to a counting procedure; rather it can be a representation system.

Just as early users of numerals may have matched the number of strokes on papyrus to the number of passing camels, people can match the force of a handgrip to the apparent brightness of a light or a number to a sensation, even when that "sensation" is a rather global impression of something as simple as a tone or as complex as social status.<sup>65</sup>

He goes on to build a bridge between the seeming incompatibility of numbers and individual feelings.

By employing certain psychophysically based procedures it is possible to quantify that which is not readily countable if one can accept matching impressions across different sensory modalities as a basis for measurement. The uncountable become quantifiable if one goes beyond a counting function of number.<sup>66</sup>

The changing nature of my practice reflects the nature of improving performance. I set up an activity; upon observing that a certain component of the activity required specific attention, I altered my approach to set more specific goals to improve feedback. Success guru Anthony Robbins offers his succinct version of a common tactic for achieving mastery, "Know your outcome, develop the sensory acuity to know what you're getting, develop the flexibility to change your behaviour until you find what works – and you will reach your outcome."<sup>67</sup>

---

<sup>64</sup> Radocy, "On Quantifying the Uncountable in Musical Behavior," 24.

<sup>65</sup> Ibid.

<sup>66</sup> Ibid., 25.

<sup>67</sup> Anthony Robbins, *Unlimited Power* (London: Simon and Schuster, 1989).

## Chapter 5: Discussion

### Results

By the end of my practice sessions I had two video recordings of my performance, one from the beginning and one from the end of the research period. I had a daily journal consisting of 21 sessions focussed on right hand technique with a mark out of ten and comments in each PETTLEP category, 23 sessions on overall performance with a mark out of ten and comments in each PETTLEP category, 8 sessions received overall comments without being categorical.

The marks are graphed in Appendix A.

Using a phenomenological analysis technique suggested by Clark Moustakas,<sup>68</sup> I collated my journal comments for each category to reveal repetitions and emerging themes. In each category I first make an overview statement. Then, I have listed the individual themes that have emerged, along with the number of journal entries that correspond to each theme. Following this summary of individual categories, I have outlined some of the universal themes that have emerged.

### Physical

There are a wider variety of observations in this category than any other. This may be due to the depth of existing knowledge and broad vocabulary I have in this area.

#### *1. Noted link between mental and visual (9)*

The most overt theme in this area was the correlation between mental clarity of an action and the quality of execution of that action. Examples of this occurred in reference to tone production, hand position leaps, speed of execution and intensity. This suggests that it is not linked to one specific

---

<sup>68</sup> Moustakas, *Phenomenological Research Methods*.

technical area. It seems to imply a direct relationship between the qualities of both activities.

### *2. Use of creative visualisation (6)*

I used creative imagery for increasing fine motor control, raising standards, increasing intensity and focus. Imaging something with more precision (e.g. a robotic hand, perfect execution) helped to inhabit the same level of precision in my self-imagery. One factor that emerged was the perception that perfect execution must entail laser-like focus.

### *3. String contact (6)*

This also related to fine motor control. Good right hand technique requires advance preparation of fingers and there was much work done here in both imagery and physical clarity of this task. Initially, I did not visualise anything other than the current finger in use, but in later sessions preparing fingers in advance became more prevalent.

### *4. Physical intervention (especially related to warm-up) (5)*

A number of times I used a physical run through to 'connect' to the instrument to help 'wake up' the hands, with positive results. This implies a physical warm up was helpful in getting focussed for imagery practice.

I also used an approach of visualise, play, visualise, play to help identify corrections in either small areas, or in the overall flow of the piece. This is supported by research that has found physical plus imagery practice is more effective than either approach alone.<sup>69</sup>

## Environment

Reading through the journal entries in this category I found a lack of variety in the vocabulary used to describe events. I felt this limited my thinking to a certain extent, keeping my imagination within certain verbal boundaries. I need to develop a way to talk about the intricacies of this category.

---

<sup>69</sup> Wright, "The Effect of P E T T L E P Imagery on Strength Performance." 27-28.

*1. Specific person with their input (15)*

The association to excellent performance in specific areas was linked to specific people I know either personally (strongest link) or to others whose work I am closely familiar with. There is also the point that these were more likely to be musically intense situations; even just imagining a performance in front of one's peers can be daunting.

*2. Specific room/Performance space (14)*

Most of the time I did physical practice in a practice room with the imaged practice in the same room. At other times I imaged being in a performance space of which I had first hand knowledge.

*3. Non specific person/people present (7)*

Sometimes this involved the sense of a masterful but anonymous player listening intently to my practice. Other times it related to interactions with an imaged audience. My focus changed from small details of my own physical movements to the space and the feeling of playing outward to an audience.

*4. Non specific interaction with imagery (6)*

When perceiving a sound, in either visualised or physical performance, I felt a sense of the sound beginning inside my body. The more intense this feeling was, the more I felt able to project sound into the space I was in, for both physical and imaged practice.

*5. Unspecified imagery with specific effect/focus (6)*

This referred to a variety of imagery that linked an aspect of my practice to the environment in a way that seemed to be helpful. Flow, dynamics, overall preview of a performance, each of these was assisted by a sense of the environment in which they were occurring.

*6. Unfocussed (4)*

There were a number of occasions when I found particular attention on one category reduced my awareness and focus in others. Overall, most of my focus was on the physical category.

## Task

Similar to the Environment category, the words used in these journal entries were often repetitions. The entries that used different language might be more revealing than those that were repeated because they offered a slightly different point of view on what was happening.

In these entries I also found a lack of clarity as to which observations belonged in this category. This problem arose because, of all the categories, this one would be more beneficial if written *in advance* of the practice session. The specific, measurable goal of the work for each session could be laid out in advance. To improve the connection of practice from day to day, I think the task for the next session should have actually been written at the end of the current session.

I found a number of unclear entries that were really more observations of what I had done in hindsight. Other times, when an issue was identified, there was no mechanism in the journal keeping to follow up on this insight, as I kept each entry a day-to-day activity without consistent review.

### *1. Observations not defined tasks (20)*

This theme showed that I consistently failed to clearly articulate the specifics of the task I was undertaking in each session; the result being a number of hindsight observations of what occurred.

### *2. Task specified (16)*

While this title seems contrary to the previous theme, they were in fact similar. I noted that a task had been specified but not the specifications. There were a minority of cases (4 out of 16) in which I noted that the specifications were written separately at the top of that day's journal entries.

### *3. Observations related to other categories (9)*

Some entries in the Task section should have been categorised under other headings. Occasionally I noted a question or observation that I needed to revisit at another time, but I had no clear mechanism for ensuring this would be followed up.

#### *4. RH technique (5)*

Some accurate Task outlines for the right hand technique surfaced. There was a mix of what the task was during the session, and suggestions for what the task should be in the next session, but no clear system of following through on this.

### Timing

I found that using a metronome helped fight the tendency to avoid mistakes by not allowing me to stop and correct them. At other times, when I wanted no mistakes visually, I slowed down to try and clarify the movement and the sound, if a section felt uncertain. The metronome also helped to measure the speed at which technical difficulty was under control and a connection to the expression of the piece, or flow, occurred.

Focus, when complete, released any sense of length of time, but increased awareness of the individual pulsations of the metronome. Slower practice helped clarity but not necessarily flow. It sometimes also resulted in the mind wandering.

I did not note explicitly what went wrong, mentally, at top speeds. Developing language to account for this kind of observation would be helpful for this category.

#### *1. Evenness (10)*

The reason for dividing the practice, after 8 sessions, into two parts, was to focus on the weakness of a particular finger that was interfering with even timing and tone production. Particular emphasis was placed on evenness as an important outcome to achieve, which accounts for the high number of journal entries.

## *2. Speed/ clarity (9)*

Most references to speed relate to imagery being more accurate, but less functionally equivalent to actual performance. There were two main influences on which I focused. If it related to the lagging finger mentioned previously, I imaged at full speed. If, however it related to a coordination issue, such as a position leap, I spent some time at a slower speed to clarify the movement mentally.

## *3. Push limits (7)*

All but one of these entries was related to the technical part of each session. The issue was not, I believe, one of coordination, it was related to muscle memory development and nervous system training. My understanding of these areas, which are outside the scope of this paper, suggested relaxed effort to increase top speeds would be beneficial.

## *4. Use tools for timing/feedback (5)*

The tools were a metronome and video camera. The metronome was helpful for gradual tempo progression. The video was helpful for visual feedback on technical issues.

## Learning

The entries in this category were a kind of overview of what needed focus. It would be helpful to place these observations in the category to which they were relevant as a way to review insights made up to that point. A number of insights from this category are discussed in the conclusion, in relation to further refinement of the journal procedure.

### *1. Related to RH – broadly (6)*

It is not surprising that there were a number of single references to learning involved with the right hand due to the amount of focus it received during the practice. While there were some useful observations and statements, there were also notes that were too imprecise and vague to meaningfully contribute to analysis.

## *2. Unfocussed (6)*

Rather than imply that I was unfocussed, this type of entry may have reflected an inability to articulate anything not already mentioned in other categories during the current session, or it could imply that no new learning had occurred.

## *3. Focus on single drill (6)*

Entries indicate performing a single drill improved focus, gave a clearer sense of progress and helped clarify sensory acuity for the specific task.

## *4. Creative imagery (4)*

Some creative imagery uses are unspecified, but all had a positive impact when used on specific physical tasks or psychological states, such as motivation.

## *5. Internal production of sound (4)*

These entries described feeling a sense of connection to the sound, as though it was being produced inside the body before sounding through the instrument. This concept had been similarly reported in both the physical and environment categories.

## *6. Clarify task (4)*

It became clear during the research period that the Task section was not clearly defined and needed refinement to generate useful observations in that category.

## *7. Efficient learning (4)*

These entries either asked questions or made philosophical observations that required further thought. They are positive and engaging comments and offered a kind of positive psychological boost.

## Emotion

Certain words are used repeatedly in this category. This can mean they become generic and lose the potential to shed light on a new insight. A clear and ongoing development of vocabulary is important to maintain.

### *1. Positive and focussed (13)*

The positive effect of the consistent disciplined effort required by this research had a motivating effect on my state of mind. This in turn led to good focus, resulting in better quality performance practice than I would perhaps normally have achieved.

### *2. Engaged but distant (12)*

Sometimes the positive effect was tempered for reasons not identified. The psychological factors for this are beyond the scope of this paper. Often the entry specified that although I felt engaged, intensity was lacking.

### *3. Imagine Mentor presence (12)*

The image of a mentor present is an indicator of setting high standards for myself. The expectations of the visualised mentor would admit no excuse for anything less than excellence. This was also motivating as even imaged proximity to a great player helped to raise my own standards.

### *4. Unfocussed (10)*

There were a variety of ways in which this was described. Examples are: not focussed, uninvolved, and not present. This reflected either a lack of engagement for an unknown reason, or that focus and engagement were directed into a task not particularly emotional, e.g. a technical drill.

### *5. Body involvement strong (6)*

This was another dimension to the experience of creating a sound first internally, in the body, before it manifests on the instrument. There seemed to be some kind of link between perception of the deep internal creation of a

sound and the physical and psychological engagement with that sound. This makes it a very intense emotional experience.

## Perspective

Vocabulary was again a factor in recording insights in this category. There was little variety in the words chosen, which I think, again, influenced my ability to achieve new perspectives.

### 1. *Associated (39)*

The very large number of identical entries in this category was reflected in the definition related to motor imagery. It says that one should visualise from a first person internal perspective, which in psychology is known as an 'associated' image<sup>70</sup>.

### 2. *Close ups (11)*

Most entries are to do with zooming in to clarify the fine details of some technical task. Others mention a quick flash close up if a mistake or hesitancy occurred in the performance of a piece.

## Emerging major themes

I will here outline in more detail the prominent themes that are found across multiple categories.

### *Clarity in mental execution leads to clarity in physical execution*

This repeated finding suggests that only imagery that is clear in the mind can be clear in physical practice. There are times, as a musician, when we rely on muscle memory to perform and too much conscious thinking of every detail can get in the way of unconscious recall, disrupting the performance. This is reflected in the PETTLEP imagery research in the discussion of the dorsal processing in the brain (see chapter 3).<sup>71</sup> But in the initial stages of

---

<sup>70</sup> Holmes, "The Pettlep Approach to Imagery: A Functional Equivalence Model for Sports Psychologists." 76.

<sup>71</sup> Ibid.

developing technique or learning a new piece, as is the case in this research, this emerging theme suggests that clarity in imaged rehearsal should precede muscle memory performance.

*Creative visualisation is a useful tool*

The entries on creative visualisation appeared in a variety of areas. One example of this would be the image of a robotic hand executing a perfectly even passage. This kind of visualisation helped to condense a technique down to the essential components. Another use was the imaged presence of a respected figure or mentor. In this case the effect was to help raise my own standards and improve my motivation. Creative visualisation is a very old technique used from ancient times and has had myriad applications in many societies.<sup>72</sup> For the purposes of this study, the use of creative visualisation has been demonstrated to have a positive effect in a number of areas and is therefore considered an important imagery technique.

*A sense of sound creation beginning inside the body has a positive impact on both imaged and physical execution*

This could be considered a creative visualisation, but the specific and deep (and especially emotional) effect of this imagery deserves its own consideration. These entries relate to a new strength in the connection between the sounds my instrument makes and the creation of those sounds in my mind, and body, before the sounds begin. As an electric guitar player who has played a great deal with electronic effects, and has the eventual sound of the instrument emerge from an amplifier, not the instrument itself, this connection is not as familiar or immediate to me as perhaps it is to musicians who play exclusively on acoustic instruments. In this research practicing with an acoustic instrument, learning to image the sound, from various sensory modalities, emerging from within my own body as it manifests through the instrument has been a vital and potent skill.

---

<sup>72</sup> Samuels, *Seeing with the Mind's Eye: The History, Techniques and Uses of Visualization*.

### *A deep level of focus is vital*

The ability to focus my full attention for imagery rehearsal applies to all categories. Anything that improves this ability would be beneficial to imagery rehearsal. Many diary entries about focus are virtually descriptions of the quality of practice I experienced.

### **Reflection**

The structure of the PETTLEP method has allowed a variety of observations from different points of focus to shed light on insights that I would otherwise have been unaware. It is flexible enough to allow for the kinds of changes that are sometimes required in music performance practice, such as when a new insight suggests a different focus or line of enquiry. In the final chapter I will offer my views on the suitability of PETTLEP as an appropriate method for music performance practice application, and some suggestions for the application to music performance practice.

## Chapter 6: Conclusion

### Summary of the question

A central proposition of the present thesis is that imagery rehearsal is a beneficial technique to employ during music performance practice. The findings of this thesis support this notion. The results also offer directions for further refinement of the specific method employed, the PETTLEP model of motor imagery rehearsal.

There is a great deal of evidence to suggest that imagery is a very individualised experience and this research may serve better as an example of structure rather than relevant specific findings.<sup>73</sup>

### Summary of the aims/objectives

In the introduction, I outlined four areas that need to be covered to fully answer the research question:

1. *Is the PETTLEP model suitable as a music performance practice tool?*

The structured journal keeping proposed by the PETTLEP model of imagery rehearsal has been successful in shedding light on the individual processes and habits that I exhibited in my performance practice. Further, it has been flexible enough to allow continuous refinement of the practice sessions.

2. *What has been the effectiveness on my performance and how has this manifested?*

The link between mental clarity of a passage and physical clarity when performing the passage has been a reasonably accurate indication of the areas of strength and weakness in performance of the piece. Previously, the approach I would take to such a problem would be to acquire better muscle memory of the passage through repetition, building up speed as accuracy improves. But the variety of perspectives on what I was attempting, through

---

<sup>73</sup> Nicole Saintilan, "In Search of the Inner Voice: A Qualitative Exploration of the Internalised Use of Aural, Visual, Kinaesthetic, and Other Imagery in the Perception and Performance of Music" (University of Wollongong, 2008).

the seven journal categories, offered new mechanisms for feedback. This allowed more specific investigation of individual aspects of the passage, which led to more focussed attention on the explicit difficulty, rather than on complete execution of the entire passage.

The fluency and quality of my right hand technique have noticeably improved. The close attention that my right hand received during this research has developed much more acute awareness of the fine detailed movements in accuracy and tone production during performance situations, to the point that fellow musicians have commented on the improvement without prompting.

The relationship between creating a sound internally before producing it on the instrument, which arose during the research, has continued to intensify the experience and awareness of sound production.

Creative imagery, which may contradict the central premise in PETTLEP, functional equivalence, proved to be a positive and useful device. It seems that creative imagery can be used to access imagery that can't be clearly imagined with the more common approach, such as the perfect execution of a task currently beyond my skill level. It was also effective in improving motivation and raising standards, for example by imaging the presence of a mentor.

### *3. What themes and thought processes of my own have emerged?*

There are a number of observations that will require further consideration on my part. I need to reflect more deeply on each practice session, as the quality of the insights that I record for each journal entry equates to better quality analysis. Likewise, the development of better and more specific vocabulary to describe the observations I make during a session is required.

The most common topic in the journal is focus, sometimes with positive connotation, sometimes negative. Improving my ability to focus is vital and

finding ways to integrate appropriate methods, such as Csikszentmihalyi's rules for flow,<sup>74</sup> is important.

4. *What further methodological refinement could I undertake to gain more effective results using this approach?*

Once insights are made and need to be continuously incorporated into any further practice, a reminder mechanism may be more appropriate than a journal entry. For example, creating a box to tick can be enough to recall the insight for subsequent sessions. The very act of ticking the box, perhaps before the new practice session, can bring the new insight to mind and be incorporated. This would keep the purpose of journal entries focussed on new insights rather than repetition. Ticking the boxes would be very helpful to avoid both double entries, and writing an entry for the sake of writing, especially when an identified task requires action that may take several sessions.

Establishing a numerical measure for the observations was helpful, as it meant that engaging with the quality of a practice session could be judged based on subjective feeling at the time, not only in the words used in the journal.

### Summary of new knowledge that has emerged from the project

Imagery practice has, I believe, helped to further develop the motor skills I use in music performance practice. The PETTLEP model has helped to make awareness of fine details more acute, and to separate observations into very small segments. These divisions, from the seven categories, allow me to create solutions that retain the components that appear to be working successfully and make changes only to those areas that are observed to be sub-optimal.

By moving my focus to different perspectives, I am less likely to fall into habitual patterns of observation. One factor that emerged after the research period was that observations that I thought were common and significant were

---

<sup>74</sup> Csikszentmihalyi, *Flow: The Psychology of Optimal Experience*.

often reported very infrequently in the journal. Some images that were extremely vivid only occurred once, but my memory of them makes me believe they must have occurred many times. The journal helps to overcome this kind of inaccurate recall.

Developing my own personal vocabulary for observing my practice is important for analysis of the data collated. The more accurate and descriptive the language, the more clearly underlying patterns can emerge.

## New pathways emerging from the research

### *Image journaling for imagery rehearsal*

There are a number of modern thinking tools that have been developed in recent years, such as the mind map<sup>75</sup>, that attempt to use images and other visual aids that help memory and retention, instead of words alone. It is possible the journaling method proposed in PETTLEP could incorporate some of these tools, to be more functionally equivalent with imagery itself.

Is the ventral/dorsal difference equivalent to conscious recall vs. muscle memory?

Other proposals from neuro-scientific research, such as the ventral and dorsal visuo-cortical processing, seem to be similar to areas of music performance practice such as muscle memory and conscious recall, and possibly the processes involved in skills such as sight reading. There seems to be grounds for exploration of what, if any, connection these things may have and if insights from one may have some bearing on the other.

According to some research, imagery rehearsal can also be effectively used to generate creative solutions.<sup>76</sup> This suggests that imagery may be employed for activities that involve improvisation. As someone who performs as an improviser regularly, I would be very interested in the results of such research.

---

<sup>75</sup> Tony Buzan, *Use Your Head* (London: BBC Worldwide Limited, 2002).

<sup>76</sup> Amy L. and Munroe-Chandler Kossert, Krista, "Exercise Imagery: A Systematic Review of the Empirical Literature," *Journal of Imagery Research in Sport and Physical Activity* 2, no. 1 (2007).

## Coda

The constant refinement of skill development as a musician seems to currently travel in step with the ongoing insights into the functions of the brain and how we most effectively learn new skills. While this continues, there will be a continuous evolution of methods to improve music performance practice. This research is intended to contribute to that dialogue, fully aware that new understandings will change approaches, and more innovative ways of applying current understandings will emerge.

Skill development is by no means the only factor in music performance, but it is a vital one. Other areas of research are offering new psychological and technological opportunities that can be equally relevant to music performance practice. It is a field ripe for investigation.

What seems most important to me is that we make the best use of what we know now. There is no sense in waiting for someone to tell us the right way to do something; 'right' is constantly evolving, as must we.

## Bibliography

- Andreas, Steve. "Neuro-Linguistic Programming (NLP): Changing Points of View." *Family Journal* 7, no. 1 (1999): 22-28.
- Brouziyne, M., and C. Molinaro. "Mental Imagery Combined with Physical Practice of Approach Shots for Golf Beginners." *Perceptual & Motor Skills* 101, no. 1 (2005): 203-11.
- Bruser, Madeline. *The Art of Practicing: A Guide to Making Music from the Heart*. New York: Random House, 1997.
- Buzan, Tony. *Master Your Memory*, The Mind Set. London: BBC Worldwide Limited, 2001.
- . *Use Your Memory*. Millenium Edition, The Mind Set. London: BBC Worldwide Limited, 2001.
- Carruthers, Mary. *The Book of Memory: A Study of Memory in Medieval Culture*. Second ed: Cambridge University Press, 2008.
- Csikszentmihalyi, Mihaly. *Flow: The Psychology of Optimal Experience*. New York: HarperCollins, 1990.
- Cumming, Jennifer, and Craig Hall. "Deliberate Imagery Practice: The Development of Imagery Skills in Competitive Athletes." *Journal of Sports Science* 20 (2002): 137-45.
- Driskell, James, Carolyn Copper, and Aidan Moran. "Does Mental Practice Enhance Performance." *Journal of Applied Psychology* 79, no. 4 (1994): 481-92.
- Druckman, Daniel, and Robert A. Bjork, ed. *In the Mind's Eye*, Committee on Techniques for the Enhancement of Human Performance. Washington: National Academy Press, 1991.

- Feltz, Deborah, and Daniel Landers. "The Effect of Imagery on Motor Skill Learning and Performance: A Meta Analysis." *Journal of Sports Psychology* 5 (1983): 25-57.
- Frankl, Victor. *Man's Search for Meaning*. New York: Washington Square Press, 1984.
- Freytmuth, Malva. *Mental Practice and Imagery for Musicians: A Practical Guide for Optimizing Practice Time, Enhancing Performance, and Preventing Injury*. Boulder: Integrated Musician's Press, 1999.
- Gallwey, Timothy. *The Inner Game of Tennis: The Classic Guide to the Mental Side of Peak Performance*. London: Pan Macmillan Ltd, 1986.
- Goehr, Lydia et al. "Philosophy of Music." Oxford Music Online, <http://www.oxfordmusiconline.com.ezp.lib.unimelb.edu.au/subscriber/article/grove/music/52965pg3> (accessed 21.03.2011).
- Goehr, Lydia. *The Quest for Voice: Music, Politics and the Limits of Philosophy*, The 1997 Ernest Bloch Lectures. Oxford: Oxford University Press, 1998.
- Hall, C. R., W. M. Rogers, and K. A. Barr. "The Use of Imagery by Athletes in Selected Sports." *The Sport Psychologist* 4 (1990): 1-10.
- Halpern, Andrea R. "Mental Scanning in Auditory Imagery for Songs." *Journal of Experimental Psychology / Learning, Memory & Cognition* 14, no. 3 (1988): 434-43.
- Hodges, Jeffery. *Champion Thoughts, Champion Feelings*. Flaxton: Sportsmind International Institute, 1998.
- Holmes, Paul S., and David J. Collins. "The Pettlep Approach to Imagery: A Functional Equivalence Model for Sports Psychologists." *Journal of Applied Sport Psychology* 13, no. 1 (2001): 60-83.
- Johnson, Edie. "Applying Mental Rehearsal and Imagery Techniques to Learning, Performing and Teaching Organ Music." PhD diss. University of Indiana, 2003.

- Kossert, Amy L., and Krista Munroe-Chandler. "Exercise Imagery: A Systematic Review of the Empirical Literature." *Journal of Imagery Research in Sport and Physical Activity* 2, no. 1 (2007): Article 2.
- Lally, Phillippa, Cornelia H. M. Jaarsveld, Henry W. W. Potts, and Jane Wardle. "How Are Habits Formed: Modelling Habit Formation in the Real World." *European Journal of Psychology* (2009).
- Luria, A. R. *The Mind of a Mnemonist*. Translated by Lynn Solotaroff. Cambridge: Harvard University Press, 1987.
- MacIntyre, Tadhg, and Aidan P. Moran. "A Qualitative Investigation of Meta-Imagery Processes and Imagery Direction among Elite Athletes." *Journal of Imagery Research in Sport and Physical Activity* 2, no. 1 (2007): Article 4.
- Moustakas, C. E. *Phenomenological Research Methods*: Sage, 1994.
- Nachmanovitch, Stephen. *Free Play: Improvisation in Life and Art*. Los Angeles: Tarcher Los Angeles, 1990.
- Orlick, Terry. *In Pursuit of Excellence: How to Win in Sport and Life through Mental Training*. 4th ed. Champaign, Illinois: Human Kinetics, 2008.
- Radocy, Rudolf E. "On Quantifying the Uncountable in Musical Behavior." *Bulletin of the Council for Research in Music Education* 88, no. Summer (1986): 22-31.
- Ramsey, Richard, Jennifer Cumming, Martin Edwards, Sarah Williams, and Chris Brunning. "Examining the Emotion Aspect of Penalty-Based Imagery with Penalty Taking in Soccer." *Journal of Sport Behaviour* 33, no. 3 (2009): 295-314.
- Reisberg, Daniel, ed. *Auditory Imagery*. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc., 1992.
- Ristad, Eloise. *A Soprano on Her Head: Right -Side-up Reflections on Life and Other Performances*: Real People Press, 1982.

- Robbins, Anthony. *Unlimited Power*. London: Simon and Schuster, 1989.
- Robertson, Ian. *The Mind's Eye*. London: Transworld Publishers, 2003.
- Saintilan, Nicole. "In Search of the Inner Voice: A Qualitative Exploration of the Internalised Use of Aural, Visual, Kinaesthetic, and Other Imagery in the Perception and Performance of Music." PhD diss. University of Wollongong, 2008.
- Samuels, Mike and Nancy Samuels. *Seeing with the Mind's Eye: The History, Techniques and Uses of Visualization*. New York: Random House, 1975.
- Short, Sandra E., and James Afremow. "Using Mental Imagery to Enhance Children's Motor Performance." *JOPERD: The Journal of Physical Education, Recreation & Dance* 72, no. 2 (2001): 19.
- Smith, Dave, Caroline Wright, Amy Allsopp, and Hayley Westhead. "It's All in the Mind: Pettlep-Based Imagery and Sports Performance." *Journal of Applied Sports Psychology* 19 (2007): 80-92.
- Spence, Jonathan. *The Memory Palace of Matteo Ricci*. London: Quercus, 1978.
- Subotnik, Rose Rosengard. *Developing Variations: Style and Ideology in Western Music*. Minneapolis: University of Minnesota Press, 1991.
- Teilhard de Chardin, Pierre. *The Phenomenon of Man*. Translated by Bernard Wall. London: William Collins, 1959.
- Tinti, Carla and Dario Galanti. "Interactive Auditory and Visual Images in Persons Who Are Totally Blind." *Journal of Visual Impairment & Blindness* 93, no. 9 (1999): 579.
- Ungerleider, Steven PhD. *Mental Training for Peak Performance*: Holtzbrinck Publishers, 2005.
- Villa-Lobos, Heitor. *Etude No. 1*. New York: Associated Music Publishers Inc., 1953.

- Walker, Robert. "The Presence of Internalized Images of Musical Sounds and Their Relevance to Music Education." *Bulletin of the Council for Research in Music Education* No. 66/67, ISME., no. Report of the Eighth International Seminar on Research in Music Education (1981): 107-11.
- Werner, Kenny. *Effortless Mastery*. New Albany: Jamey Aebersold Jazz, Inc, 1996.
- White, Alison, and Lew Hardy. "An in-Depth Analysis of the Uses of Imagery by High Level Slalom Canoeists and Artistic Gymnasts." *The Sport Psychologist* 12, no. 4 (1998): 387-403.
- Wright, Caroline J., and Dave Smith. "The Effect of a Short-Term Pettlep Imagery Intervention on a Cognitive Task." *Journal of Imagery Research in Sport and Physical Activity* 2, no. 1 (2007): Article 1.
- . "The Effect of PETTLEP Imagery on Strength Performance." *International Journal of Sport and Exercise Psychology* 7 (2009): 18-31.

## Appendix A – Journal Entries

### 13.9.10

(Video @ 2:40)

Recorded video of 3 points of view as a base line for comparison after PETTLEP work.

I notice I'm not bending first joint enough, nor displacing the string on the right angle - when compounds the wrong joint movement.

There is little dynamic variation and the time is kind of static.

The main thing here, RH movement, shows little conscious awareness. I don't have the images I see on video in my mind. There is a kinesthetic feeling, which I notice has a kind of delayed response on the *a* finger i.e. it feels like that finger lags behind my kinesthetic sense of when it *should* attack the note.

A bit like lifting a very heavy weight can make your movements slower than you expect them to be - they still move but it's almost at a speed that someone else controls.

My nails are in poor shape mostly, with the exception of *a* which is average.

### 16.9.10

PETTLEP design

**Physical** - Some points: Weight of guitar, position of guitar, sitting position, R arm resting on guitar, angle of RH finger contact with strings, pressure (and resistance) of finger on string, prep finger for each note, finger return after each note, RH fingers 1st joint bending, point of contact on nail, synchronization with LH.

**Environment** - use cushion, imagine a specific performance space (that I am familiar with)

**Task** - at my current level, I am trying to automate correct RH contact with the strings for strong tone

**Timing** - try with a metronome, at different speeds,

**Learning** - as I make mental connections embed, them in the image,

**Emotion** - imagine an audience of peers

**Perspective** - try individual fingers to isolate kinesthetic

### **15.2.11 (#1)**

I notice today, my first formal practice of this piece for many months that I sometimes (perhaps always?) pull a face when I play something incorrectly.

In PETTLEP it is emphasised that you visualise your current level of performance, allowing for improvement next time (ref#???). I find myself often trying to imagine what I *want* myself to be able to do, rather than visualising exactly as I currently see it. I'm unsure if the line is so clear cut, and if it's possible to inhabit my current level separate from the level at which I'm aspiring to play.

It is also clear that this model can be used to visualise drills meant to improve execution. For example I can use PETTLEP to clearly visualise preparing each finger to pluck the string along with the next finger creating pressure in preparation for execution. The Emotion aspect here can be imagining I am performing this in front of my classical teacher, knowing he will not tolerate any imperfections.

### **16.2.11 (#2)**

#### *10 minutes visualisation*

I found that playing the piece internally while sitting and holding the guitar helps understand the areas that are less clear and the speed at which I can 'see' myself doing the piece is about the speed (exactly?) that I can consciously and accurately hit the right notes.

I do need to trigger my awareness to pay attention to details such as breathing, tone, awareness of who is in front of me (imagined), the fingertip touch of the notes, the musical flow.

The sound I can hear internally fairly clearly.

There is a slight undulating between the visualisation being associated or disassociated. Occasionally I see the RH as if the guitar is in front of my and slightly to the right, and slightly up (which gives a clear view of the fingers contacting of the string). But mostly it is associated.

I resist trying to imagine it faster, but at this stage, this is the speed at which it is clear in my mind.

### 17.2.10 (#3)

Triggers to consciously use:

**Physical** - breathe into my lower diaphragm

**Environment** - clearly recall the precision required in A. Field's presence

**Task** - focus on correct changes and flawless transitions

**Timing** - relax with the current speed

**Learning** - what did I learn last time; what this time

**Emotion** - A. Field and Ralph are in front of me

**Perspective** - stay associated throughout

#### *10 minutes visualisation*

There is definitely a sense of more clarity in the internal representation.

Trouble spots seem (perhaps?) *more* difficult. There is a big difference between imagery I am clear on and parts that are unclear.

I forgot to breathe until a deep sigh occurred (unconsciously) and reminded me. It feels different physically breathing deeply; my body against the guitar seems to shift where my sense of the sound is coming from.

I'm very conscious of the RH and LH fingerings but have not created imagined surroundings or people.

### 20.2.11 (#4)

#### *10 minutes*

Observations

**Physical** - There was a much more prominent sensation of the correct contact between RH fingernail and the string to produce the best sound. Clarity of kinesthetic feel was strong. Good sense of depressing the string for volume. Breathing was a little more consistent, but was occasionally forgotten.

**Environment** - Still less focused here.

**Task** - Focus was on the RH tone production this time.

**Timing** - Less pausing (only on the position leap) gave overall a better flow

**Learning** - Tone production concepts have been vague during visualisation up until now. My mind went to the next level of finger preparation occasionally but I consciously chose not to try that yet as I don't feel I have the basic

technique under control.

**Emotion** - Less focus here.

**Perspective** - Associated throughout, occasionally moving to a 'close up' associated image of my finger contacting the string.

Today was very positive and a little unexpected in how strong the kinesthetic sense of contact for good tone was visualised. Less pausing or repeating unclear sections - really just the two position leaps to 12th fret. I think an increase in speed (approx 90bpm currently), or an addition of focus is appropriate.

Next action: Repeat visualisation 2nd time includes RH finger preparation.

### **21.2.11 (#5)**

Today I began with a 10 minute warm up routine. String crossing and rasgueados for about 10 minutes. Then I played through the piece once with a few pauses at unclear spots.

*10 minutes*

Observations

**Physical** - Strong tone. Perhaps slightly less clear than yesterday at times. Breathing much improved, more conscious of when I'd stopped breathing deeply.

**Environment** - Occasional posture correction. No real definition of the room I am performing in. I can use NLP of great performance experiences to imagine a room I associate with positive achievements.

**Task** - I became aware of the importance of outcomes in relation to defining the task. I need to work at this speed now, but my goal is 120bpm. There is importance in stressing this as part of the whole approach I think. On the second run through I doubled the timing and this worked well too. Pushing myself can be turned into a simple task rather than a big thing by defining it and progressing to the next definition.

**Timing** - On second time I doubled subdivisions and this led to still good tone, a few extra errors in spots. But this is exactly what happened at slower speed.

It clarifies bad spots. The other factor is I'm aware I need to have conscious visualisation of finger preparation, which is at a slow stage now. I need to find the timing limits of this from now on.

**Learning** - Today I see that I can push different components of the visualisation to different speeds. I think this separation is helpful in learning to clarify the image of what I am attempting, but as soon as there is an image it needs integration into the whole. So keeping it slow enough for the weakest aspect is necessary.

**Emotion** - Good sense of Ralph and Field listening/watching. They were paying extra attention to tone production. They were conscious, as I am, that the speed must increase to play the piece properly, but they acknowledged the need for work on tone at this speed. There was a sense of camaraderie in their presence and perceived input.

**Perspective**- Associated. I feel located in my head; my attention doesn't really roam down to my fingertips or into my shoulders etc. This may be a useful idea to focus on areas of improvement.

### 22.2.11 (#6)

I ran through the piece before visualising today at a medium tempo, a little faster than the vis speed. My hands felt the most free flowing I've yet felt playing today. This is very encouraging.

Also, there is one chord I think I've been **missing from the visualisation**. After the first Am at 5th fret there is a Bbdim chord that comes before the Em at 7th position.

### Observations

**Physical** - The a finger sounds too loud when I play so I visualised the RH moving further up the neck across the arpeggio to soften the top notes, and dug in to the string deeper on the low strings. This feels quite consistent internally.

**Environment** - No real picture of a room.

**Task** - The job today was the same with the altered RH movement. This requires imaging the RH fingers resting on the E,B strings slide along as the hand approaches them. Need to see it more closely to ensure each finger

stays in line with each string.

**Timing** - ON subdivisions, timing fluctuates as attention wanders to other areas

**Learning** - Adding in RH movement has altered the goal.

**Emotion** - Some reference to Ralph and Anth, but fleeting. Focus was on hands more.

**Perspective** - Associated. Some movement into RH fingers to strengthen contact and to move tone position. They seem oversized from this perspective, or I shrink when looking at them up close.

Playing the piece straight after, the RH movement is much different kinesthetically to what I imagined. Also, leaving fingers on e,b strings during soft means they slide along the string, creating drag and a small noise.

### 23.2.11 (#7)

Warmed up on piece. Feels uneven and tone erratic. RH tone movement feels ok, but other things now feel less familiar e.g. keeping *m*, *a* on string during first 5 notes of RH sequence.

#### Observations

**Physical** - At first I'm conscious of the feeling of the RH tone movement, but toward the end I realise I've lost awareness of it. Some occasional consciousness of breath, but mostly focus on RH strength of contact and co-ordination. Some awareness of finger 1st joint being responsible for pressure of string displacement.

**Environment** -Some sense of a resonant room at one point, but lost to focus on RH.

**Task** -The new RH movement is for tone production and dynamic control. I was internally hearing the tone change significantly from about half way through.

**Timing** - There is accuracy at half and double speed 95bpm in visualisation that is less consistent in reality.

**Learning** - Thoughts progress to the next step easily but fingers, in reality, suggest more work at the current level is required for better congruence with

visualisation of best performance.

**Emotion** - Early images of Ralph and Ant but lost when focus is strong on RH.

**Perspective** - Associated. No close ups.

### 24.2.11 (#8)

Warm up on piece. Played all RH further along string (toward neck), found this much more difficult to be accurate due to string tension at this point. Kept a finger touching string during RH tone movement, help feel more secure.

Observations @100bpm (8th/16th)

**Physical** - RH tone movement better. Absolute clarity touch is not vivid when attention is shared with anything else. Posture is ok, some tension when at 16th notes in Rarm and R side neck. Breathing intermittently deep. At times awareness goes to RH finger being moved by correct knuckle. At faster speed it's clear I need better RH preparation to play this fast cleanly. (6/10)

**Environment** - Not much here. (1/10)

**Task** - Increasing speed feels premature for RH preparation. My instinct after today tells me to slow down a bit and do some specific slow work on RH preparation. The quality of clarity when I actually play at the vis speed supports this - unclear and RH fingers feel clumsy. (7/10)

**Timing** - There are times when I repeat an unclear section or 'breathe' into the line. I think I need to be a bit stricter to on tempo to help visualise the flow of the piece better. (6/10)

**Learning** - Over stepped this time. Need to slow down and do extra work on preparation. (5/10)

**Emotion**- Moments of Ralph and Ant. On the whole positive that I'm working consistently on this project. (6/10)

**Perspective**- Associated. Didn't move in or out today. Attention is almost entirely in RH at the moment. Occasionally in LH for specific chord shape changes. (5/10)

### 28.2.11 (#9)

After the last session it's possible I had a lingering subconscious negative

feeling about this practice. Realising I was going too far too fast, I may have avoided this practice for more days than I realised.

#### Observations

**Physical** - RH focus on contact is intermittent when attention goes elsewhere. But today it was better than last time. Possibly due to clarity, but also possibly due to speed reduction (90 bpm). No real concentration on breathing.

**Environment** - Much better today. During first repeat (90bpm) I was clearly in Fields office with him listening.

**Task** - I feel the need for a separate development session on RH preparation. This is the area that, during physical practice, feels unsmooth and creates unwanted noises (scratches etc). During visualisation there is no awareness (little) of each finger after the moment of contact and striking the string.

**Timing** - Overall, the flow is a little sloppy in physical execution. RH needs better prep and more precision for flow to feel more uninterrupted.

**Learning** - In order to clearly keep a finger on the string prepared, I allowed it to lightly rest on the high E string during visualisation. This is in keeping with PETTLEP functional equivalence. This allowed for clear kinesthetic and tactile sensation that the finger was in the correct place. During physical performance afterward, the finger has clearly absorbed this information and sat in position easily. I think this additional approach could be a vital tool for musicians.

**Emotion** - I have a more inquisitive 'lesson' type emotion when in front of Ralph and Field. While there is the sense of performance for them, it is not a concert hall etc and the intensity of emotions that come with that.

**Perspective** - Associated throughout. There is an occasional dis-associated flash of something my RH is doing, or isn't doing. E.g. close up of finger follow through.

#### 1.3.11 (#10)

##### Observations

**Physical** - Attention on RH flow and a finger in particular. The follow through is further and slower than *i* or *m*. Timing noticeable especially if it is not already prepared on the e string. 12 Pos jumps still not totally clear internally

at top speed (16ths @ 90bpm). More consistently deep breathing throughout. More freedom in body moving to music throughout, swaying with dynamic swells. 6.5/10

**Environment** - Performance space was not clear, but sense of an audience was. Playing out to the audience helps relax physically. 6.5/10

**Task** - Performing the piece with occasional corrections. RH *a* finger lags, but with focus remains close to others speed. 6/10

**Timing** - Flow felt strong when body moved. Noticeable *a* lag. 6/10

**Learning** - Breathing has become more natural rather than conscious. RH evenness is unclear. 6.5/10

**Emotion**- Different energy into the music when perceiving and audience listening. More scope to the projection of the sound. Sense of joyous risk. 6.5/10

**Perspective**- Associated. Sense of space out to imagined audience (ahead and slightly to the left). 6/10

### 2.3.11 (#11)

#### Observations

One of the 'learning' occurrences is that I'm refining my methodology for this journal. I've identified that RH preparation technique needs special focus on several occasions. I now aim to use PETTLEP specifically on a short daily practice session, in conjunction with actual practice. Since this is what would be needed in preparation for a public performance, it makes sense, and functional equivalence, to introduce a method to fix what I perceive as a 'problem' area.

*a* finger:

**Physical** - I can definitely visualise the *a* finger muting the string faster than I can actually do it. I am focusing on the return motion and where that is instigated from in the hand mechanism. Returning to the exact point on the nail to pick with is a little unclear. 6.5/10

**Environment** - A sense of presence in that I am in front of a master player trying to develop this skill. 6/10

**Task** - Focus on playing scales with *m* and *a*. Play the one bar pattern that

uses *i a m a*. 6.5/10

**Timing** - This is the key goal in this exercise and I feel like there is a clear difference between what I can clearly visualise kinesthetically, and what happens in reality. 6.5/10

**Learning** - Session #1 so..

**Emotion**- Positive energy in working on this. Hard to see progress day to day, but a real sense of working on the important things is encouraging. 6.5/10

**Perspective** - Associated mostly. Some close ups of the return movement and back on hand to see if correct mechanism is in use. 6/10

Piece:

**Physical** - I find much extraneous noise, slight imperfections of fingers grating strings and picking that are not totally clear when I physically play. I consciously visualised my hands being as precise as a machine and I faded in and out of physical playing throughout the session. This also blurs the line between the visualisation and actual memory. 6.5/10

**Environment** - Positive space, like a room of other students rather than a performance.6/10

**Task** - Clearer once I imagined clarity of noise. 6.5/10

**Timing** - Slow speed allows better evenness. At fast speed I don't clearly see the 12th fret leap towards the end. This may need special focus. I tried it slower and slowly sped up which was good up to a point, but not as fast as the rest of the piece. 5.5/10

**Learning** - This clarity issue, removing extra noises, was easy to integrate.

**Emotion** - Positive energy, but didn't feel emotionally charged or engaged. 5.5/10

**Perspective** - Associated, but not intensely inhabiting like a performance. 5.5/10

### 3.3.11 (#12)

a finger

**Physical** - Slight imperfections in sound, knocking with the finger on return and the 'click' of preparing the finger add up to much noise. The first two are fixable with my current knowledge, they are general sloppiness. The latter is

trickier.6/10

**Environment** - As this is a practice issue the only environment that helps is in front of a teacher. Didn't do this today.3/10

**Task**- Clear task. a finger needs to develop better speed and control. 6.5/10

**Timing** - The timing is noticeably on lag when tempo increases in any pattern. How did I not notice this before? 6.5/10

**Learning** - Learning is slow so today is a continuation of yesterday's beginning.6/10

**Emotion** - Real progress comes slowly. This is long term and there is a good feeling when I work on long-term things.

**Perspective** - Associated, but more watching hand and occasional entry into hand mechanics.

### *Piece*

**Physical**- Felt a bit flat and less precise today. Good posture mostly. Rough execution mentally.5.5/10

**Environment** - Started consistently, lost focus toward end. Body language seems to help energy of playing at times. 6/10

**Task** - Clear. Focus wandered a little. 6/10

**Timing** - Slowed down on fast time, sped up on slow. 12th position jump clearer and more in time today.6/10

**Learning** - Flat feeling today. Energy and focus wandering.5.5/10

**Emotion** - Early on moments of performance energy, faded in second half.6/10

**Perspective** - Associated, but in my head rather than alert awareness I am aiming for.5.5/10

### **5.3.11 (#13)**

I began with a warm up run through of the piece. It felt sluggish and my fingers were cold. I recalled yesterday doing the piece at 125bpm so I tried it at this tempo to loosen/warm up my fingers. It worked. I felt warm and agile after a few bars. It also changed perceptions at 90bpm - seemed very slow, and I felt like I had a fraction more thinking time. This waned over the session where at 90bpm16ths i felt rushed again by the end.

*a* finger

**Physical** - Started sluggish until physical practice at 125bpm. Then seemed much more alert and agile. 6.5/10

**Environment** - No real awareness of anything but close in contact. Ok for this I think. 6/10

**Task** - A little unfocussed, tried too many things rather than drill something, so no real clarity. 5/10

**Timing**- Again, unfocussed. 5/10

**Learning**- Unfocussed. 5/10

**Emotion**- 4.5/10

**Perspective** - RH disassociated at times, watching the hand rather than inhabiting it. 5/10

*Piece*

**Physical** - Sitting ok throughout. LH felt good, RH seemed to get a bit sluggish toward the end. There is definitely a lack of precision in my imagery when using the *m* and *a* fingers. I can see the link between this kinesthetic lack of precision and the extra noises I mentioned previously. 6/10

**Environment** - Some thoughts of performing for my class, but I didn't feel any nerves, just caught up in my own attention on my playing and the class was just there, not really involved. 5.5/10

**Task** - At 8th notes tried to do prep stroke. This started to improve in clarity in imagery. But tempo is too fast. Started out ok, straight after physical performance at 125bpm, but gradually lagged.6.5/10

**Timing** - Still slower than ideal. I will move this up for at least one time through the piece.6/10

**Learning** - Some additions due to warm up today. Attention picked up link to extra noises in Environment (above). 7/10

**Emotion** - Positive but not life or death, not really *exciting*. 6/10

**Perspective** - Associated. Still very mush in my head for this perspective. 5.5/10

### 6.3.11 (#14)

a finger

**Physical** - Better focus on the fine movement. Clearer image of the return motion for preparation 6.5/10

**Environment** - In the practice room. A sense of slow motion preview of the actual event. 6/10

**Task** - A bit of a 'noodling' session rather than specific task focus. At the end I went through the RH pattern specifically, stopping string as quickly as possible. 6/10

**Timing** - Slow practice, not really performance rehearsal. Ok but no focus on sense of flow. 6/10

**Learning** - Still unfocussed, trying out little everything. Consolidate is the lesson! 6/10

**Emotion** - Some involvement. At one point, a sense of frustration flared up at having to do slow practice. This went deep, and felt like an issue that is holding me back generally. It was the same feeling I get when I can't bring myself to start practicing and instead procrastinate. 6.5/10

**Perspective** - Associated. At times zoom in and watch. *a* finger tendon in wrist is quite far to the left, *i* and *m* are more central and closer to each other. 6.5/10

Piece

**Physical** - Better sense of the RH pattern being two halves: skip a string on the way up, adjacent strings on the way down. 6.5/10

**Environment** - Performance for teacher or small group. Not intense. 6/10

**Task** - Clearer. Occasional mind wandering. Moved RH to back of sound hole for better tone overall. Maybe I'm moving too far along with tone change? 6.5/10

**Timing** - Slower speed mind wanders. Faster speed in between practice/performance. Time to try performance speed visualisations. 6/10

**Learning** - Better understanding of two halves in RH pattern. Equates to better phrasing. 6.5/10

**Emotion** - Some sense of performance, but I know it's too slow for actual

performance, and I get a sense that an audience (Field) is pushing me to go faster. 6/10

**Perspective** - Associated. Not much awareness outside upper body, no sense of feet and legs.6/10

### 7.3.11 (#15)

(6am practice session)

a finger

**Physical** - Gap between imagery and physical is still wide. Tried some rasgueado to engage reverse tendons. This will be helpful long term. Need to review my chair. 6.5/10

**Environment** - In the practice room. 6/10

**Task** - More focus on the pattern. Go slow and drill is the key. Feels like the right thing to do. Still slightly avoiding very slow repetition (or am I imagining it because it resonated so deeply yesterday?). 6.5/10

**Timing** - Slow and fast. Imagery is clear slow, less clear around a finger when fast. 6.5/10

**Learning** - Clearly conscious of putting together the factors I'm aware of. 6.5/10

**Emotion** - Positive and focused. 6.5/10

**Perspective** - Associated. Attention goes from kinesthetic to visual gauge of movement most often. 6.5/10

*Piece*

**Physical** - Chair is not quite right, perhaps too low. At 90bpm feels strong and clear, especially after warm up at faster speeds. 6.5/10

**Environment** - Mostly practice room, some images of playing for class but not clear. 6/10

**Task** - Good. Focused and consistent at both speeds .7/10

**Timing** - Better today - more regular time. Slow speed allows for more items on the focus 'checklist'. 7/10

**Learning** - Integration of tone variation and dynamic inconsistencies are clearer.7/10

**Emotion** - Some involvement. Realised I need an actual performance to

improve functional equivalence. Attention to breathing space etc needs physical feedback. 6.5/10

**Perspective** - Associated. Attention moves from kinesthetic to visual mostly. Auditory imagery is fairly strong except perhaps in descending dim section. 6.5/10

Notes: New chair. Morning practice is the best so far. A new segment could be auditory clarity or something similar, to pay extra attention here.

### **8.3.11 (#16)**

7am

a finger

**Physical** - A little shaky at 125bpm. Good contact, tone. Repetition of pattern only helps accuracy noticeably during session 7/10

**Environment** - Some consideration of performance later today, but wandering thoughts. 6/10

**Task** - Good focus on the pattern only, with some isolation of sections. 7/10

**Timing** - Good to vary for different perspectives. Total accuracy only occurs at slow speeds. 6.5/10

**Learning** - Better focus when doing one specific drill. Less mind wandering. 7/10

**Emotion** - Engaged but not dramatically 6.5/10

**Perspective** - Associated. 6.5/10

### *Piece (#16)*

**Physical** - Some clarity at faster speeds in imagery 110bpm. Lag in a finger is less noticeable in physical after doing fast run through 125 bpm. 6.5/10

**Environment** - Thinking of today's performance but not inhabiting the space. 6/10

**Task** - Trying different tempos is good. I tend to hold back to be a perfectionist (same in sight reading) so I know I need to push. 7/10

**Timing** - Tend to slow down when trying faster 110 slowed to 95bpm. 6/10

**Learning** - Some sense of growth here as I'm trying out either more focused ideas (e.g. rh drills) or pushing my limits (e.g. tempo) 7/10

**Emotion** - A bit distracted but some thoughts on class performance

today.6/10

**Perspective** - Associated. Sometimes move to image of me from audience perspective 6.5/10

### ***PERFORMANCE***

Today's performance was important to measure the level that I can perform this piece and to gather more accurate functional equivalence guidelines to use in imagery rehearsal.

**Physical** - I felt distant from my physical body. Looking at my RH I felt like it belonged to someone else and I was watching (dis-associated). I was tense and a little fatigued. One reason was that I did not properly warm up. I felt some mild tension throughout my body, which I usually do not in performance. I tried to alter a few things during the performance, such as reducing RH finger movement and tension, but it didn't succeed.

**Environment** - The space was a big factor in my performance feeling distant. The unfamiliarity of the size of the room meant the sound was alien to me. I think this is a factor I have not given enough weight previously or in imagery rehearsal.

**Task** - As I moved through the piece, I left my plan for the piece. I didn't include tonal change. I didn't focus on the ebb and flow of the ascending/descending pattern. Instead I made up a kind of breathing slow down between chord changes.

**Timing** -The speed was unsettled throughout the performance. At no point did I feel the flow of the piece.

**Learning** - I was aware of these things as they were happening but couldn't seem to change them in the moment.

**Emotion** - I felt a little tense for the performance, more than have previously felt in that space, but I was surprised at the extent to which I felt locked up technically and mentally.

**Perspective** - From the start the unfamiliar tension and sound put me in a dis-associated state. It was by attempting to return to an associated state that I was trying to get back into the performance as I imaged it.

### 9.3.11 (#17)

a finger

**Physical** - This is becoming more familiar and now I feel like time needs to work it's magic. The key now is mental - stay focused and attentive.7/10

**Environment** - Still not very aware of the space. More attention needed. 5.5/10

**Task** -Clear and better focused. Do the pattern with staccato RH. 7/10

**Timing** - Good to push speed limits and challenge myself. 7/10

**Learning** -The idea is clear. Implementation is now drills.7/10

**Emotion** -Good focus, but distance from environmental presence is not functionally equivalent.5.5/10

**Perspective** -Associated. Not much full body awareness. 6/10

*Piece*

**Physical** -RH is still not fully controlled. Posture and breathing were marginalised in favour of RH focus.6.5/10

**Environment** - Not enough functional equivalence. Mental focus is still very consciously on RH and doesn't move to other areas without losing RH focus.5.5/10

**Task** -Clear technically. More elements to come here include specific outcomes in aesthetics, breathing, posture, flow. 6.5/10

**Timing** -Pushing the limits here does reduce RH control and increases extra noise but this is more functionally equivalent to performance. More actual speed is better.7/10

**Learning** -Realising I'm spending too much time on slow practice in favour of actual performance levels was clear in performance yesterday.7/10

**Emotion** -Technical details block emotional engagement. More performance functional equivalence will help. Go play in a big room. 6/10

**Perspective** -Associated. What are some other perspectives to help outcomes? 6.5/10

### 10.3.11 (#18)

a finger

@90bpm/ Reverse scales (3 modes)

**Physical** -Good focus on control and better feeling of consistency. The return motion is clearer in imagery.7/10

**Environment** - In the practice room. No image of performance here.5.10

**Task** - Clearer specific purpose. Staccato @90bpm, 3x reverse scales, imagery and some physical rehearsal.7/10

**Timing** -Selecting specific times is helpful. 90bpm smoothness is the current goal.7/10

**Learning** - More disciplined with specific task numbers. Return motion clearer.7/10

**Emotion** - Not so involved. Positive about the focus.6/10

**Perspective** -Associated. Close in attention on RH.6.5/10

*Piece*

@110

**Physical** - Contact strong and clear. Notes clear except for 12 pos jumps.7/10

**Environment** -Clearer with performance fresh in my mind. Resonance of room hard to imagine. A sense of guitar sound being heard in the different space slightly there, but unclear.7/10

**Task** - Clear and specific. Settle on 110bpm as current level.7/10

**Timing** -Consistent throughout, except 12pos jumps.7/10

**Learning** -Specific goal setting helps settle focus. Now learn about 12 pos! 7/10

**Emotion** -Imaging space helps emotional involvement. Maybe again from recent performance association.6.5/10

**Perspective** -Associated. Managed to divide attention between RH close up and room resonance.7/10

### 11.3.11 (#19)

a finger (10m)

@90bpm 1/4, 1/8ths staccato, reverse scales

**Physical** -Took a while to get image clear. Reverse scales really 'wake up' the tendons associated with return motion.6.5/10

**Environment** -In the practice room.5/10

**Task** - Clear and focused. Added time limit for clarity of goal. 7/10

**Timing** - Still hesitation keeping up with 1/8ths@90bpm. Need to push through.

**Learning** - Current learning needs to include this 'push through' idea that I keep saying.6.5/10

**Emotion** - Determined. Patient. Not intense though.6/10

**Perspective** -Associated. Need to get right in the middle of the return motion to really intensify the sensation.6.5/10

*Piece (10m)*

@110bpm

**Physical** - Ok. Touch not intensely clear. Isolated first 12 pos jump; much better in imagery performance. I can definitely do things physically that I can't yet image.7/10

**Environment** - Some focus on audience imagery. When audience imaged, my attention seemed to jump out to them, leaving me less tightly focused in the technical fine details. When I noticed this and stopped imaging them, it shifted back in. I could repeat the process of shifting in and out triggered by the image of the audience. 7/10

**Task** -Good mostly. When I imaged my Cert IV class as the audience, I gradually went off noodling on ideas I imagined they would relate to, and their response. This is interesting. When I accessed an imagined interaction with the audience I started noodling. I haven't done that virtually at all in these practice sessions. Is there something about accessing creativity that requires a 'noodling is allowed' clause? Not sure why, but something tells me this is a good and important insight.7/10

**Timing** - Quite happy at 110 now. Even and consistent. 7/10

**Learning** -Focus on 12th pos shift has largely clarified the image, some work still to do. Seems silly I didn't do this to start with.7/10

**Emotion** - Determined. Not intense.6.5/10

**Perspective** -Associated. When expanding with audience imagery, maybe less associated, but not dis-associated. Less intense.6.5/10

### 14.3.11 (#20)

a finger

**Physical** - Clear sense of staccato rebound. Physical practice before and after helps to internalise and correct imagery. Overall sense of improvement in speed. Accuracy still fluctuates. 6.5/10

**Environment** - Practice room. 6/10

**Task** - Good clear work. No specific time limits allows some noodling from one thing to the next.6/10

**Timing** - Good focus on setting timing goals. Use the metronome.7/10

**Learning** - Focus in physical and imagery needs to be clear on the rebound motion in staccato. Good. 7/10

**Emotion** - Focused and determined. Some noodling between tasks. 6.5/10

**Perspective** - Associated. I'm not using other possible approaches here. 6/10

*Piece*

**Physical** - Good focused sense of touch and dynamic flow.7/10

**Environment** - A sense of performing in a grand hall a la Narcisco Yepes. Flow was strong and helped the sense of performance.7/10

**Task** - Possibly better balance between physical and imagery practice is required. Too much physical and only one imagery rehearsal. 6.5/10

**Timing** - Good. Sticking to tempos. Maybe slowing down slightly in imagery? Video.7/10

**Learning** - Applying flow and dynamic breathing is a good step. Once the technical is working (soon), I need to fill the focus void with more nuance and detail.7/10

**Emotion** - Strong. Associated closely with environment imagery today. Breathing physically and dynamically. 7/10

**Perspective** - Associated with some images of Yepes.6.5/10

### 15.3.11 (#21)

a finger

**Physical** - Hard to tell if incremental improvement is being made. There is still occasional inaccuracy with finger flapping about missing string. A little more

consistent. Perhaps recording practice will give a better measure of progress? 6.5/10

**Environment** - Practice room. 6/10

**Task** - Good specific target. 10mins *a m a i* pattern and *m a* scales. Use metronome too. 7/10

**Timing** - No measurement. 6/10

**Learning** - Introducing more methods of measurement is something I have neglected to enforce consistently. 6.5/10

**Emotion** - Not really engaged. Focused but intellectually. 6/10

**Perspective** - Associated. Occasional move in to isolate return motion. 6.5/10

*Piece (forgot to write in details today!)*

### **16.3.11 (#22)**

a finger

**Physical** - Imagery acts as a kind of standard especially during warm up. I can make technique more precise using imagery, when I know I'm currently below my standards. Does this mean I can raise them using the same method? 7/10

**Environment** - Practice room. A sense of use in performance but unspecific. 6.5/10

**Task** - Good. 15mins on scales, pattern, a small amount on reverse picking scales (*rasgueado*). Mix of physical and imagery. Still perhaps more imagery than physical is required? 7/10

**Timing** - Used metronome for each particular exercise. Good. 7/10

**Learning** - Realisation that my perceived standard occurs in imagery but not always in physical practice. Imagery helps raise my physical playing up to this standard by combining the two. This asks can I raise this standard to raise my physical standard? 7.5/10

**Emotion** - Strong. Determined. These are what I felt not what I imaged feeling. 6/10

**Perspective** - Associated. Consciously associated today. Clear focus on close up of a finger but without losing associated perspective. 7/10

### *Piece*

**Physical** - Good touch and flow. Clear sense of dynamics. Broken nail is clearly different in physical practice from imagery. I have an ideal imagery kinesthetic of the contact with the string. 7/10

**Environment** - Consistent sense of performance. The presence of Field clear, but sense of space in a room not as often. 7/10

**Task** - Very clear. Metronome marking for each run through. Dynamics plan for each run through.7/10

**Timing** - Good. Metronome markings consistent. Imagery consistent. More focus on flow helps evenness of tempo.7/10

**Learning** - Dynamic variations in each run through. This overall plan for dynamics has taken me to a different overview of performing the piece. This also relates to clarity of performing environment.7/10

**Emotion** - The perceived expression I am putting into the performance defines how intense the emotions I feel are. I image the presence of certain people, but the intense emotions of an actual performance were not there today.6.5/10

**Perspective** - Associated. Still very RH focused throughout. 6.5/10

### **17.3.11 (#23)**

*a* finger

**Physical** - Good focus to intensify exact sensation of return motion on each finger.7/10

**Environment** - Sense of performance but not a specific room, or audience. Played the exercises *for* an audience.6.5/10

**Task** - Need to be absolute. 5min scales *m a*. 5 min *a m a i* pattern, 5min imagery.7/10

**Timing** - Metronome 90bpm. Refine appropriate subdivisions and really lock in imagery to metronome.6.5/10

**Learning** - Imagery on pattern helped accuracy using yesterdays idea that inaccurate physical practice is helped by accurate imagery. Worked again today.7/10

**Emotion** - Lesson with Mags yesterday about playing only and totally

truthfully. This means intense and meaningful. Did this today. 7/10

**Perspective** - Associated. Need to do a checklist of these criteria *during* imagery practice to use them better.6.5/10

*Piece*

**Physical** - Clarity of imagery good. Spent slow time on 12pos shift to really clarify. Much clearer sense of pitch and a kind of system as to what note groupings make sense to me in playing and in memorising. I chose the open E and B string as one group, then 2 notes, 3 notes. This kind of system seems to help imagery clarity especially trying to visualise at speed.6.5/10

**Environment** - Good at times. Performance flow makes me more conscious of dynamic and tonal qualities.6.5/10

**Task** - Physical@125 to start. Imagery@110 next. Some staccato next phys/imagery(no metronome). 12 pos isolation phys/image (no metronome). Imagery@110 more dynamics.7/10

**Timing** - Flow at 110bpm is more natural. 125bpm warm up does not seem as fast now. Must not stop to correct - I don't during dim chords but do during position shifts - why?6.5/10

**Learning** - Followed up on intensity and specific tasks (less waffle). 7/10

**Emotion** - Not intense at a performance level. No real attempt to do this. 6/10

**Perspective** - Associated. Some close ups during 12 pos slow work (unconscious). 6.5/10

### 22.3.11 (#24)

*a finger*

**Physical** - Clear imagery of return motion was not happening today. Playing motion was fine, Noticed other sensations with a bit more clarity, as I see now the need for full body involvement in the sound.6.5/10

**Environment** - Mostly practice room. Some images of Field showing me correct staccato and telling me to make it shorter. 6/10

**Task** - Clear goal setting, and sticking to it. The timer and metronome both help stay on track when a specified goal is being pursued. 7/10

**Timing** - Some sub-division wandering occurred. Needs to be more progressive.6.5/10

**Learning** - The idea that a quick visualisation can 'prepare' the CNS before physical practice was one I'll explore more. 6.5/10

**Emotion** - Thinking about full body involvement makes me want to be more passionately involved in making a sound.6.5/10

**Perspective** - Associated. Moved in close to focus on return motion a few times. Some angles from Right elbow looking at RH fingers. 6.5/10

### *Piece*

**Physical** - Felt a bit rusty today. Good posture, caught most slouches as they occurred. Tried to connect sound as coming from inside me. This is more a 'creative' visualisation, but I feel it could be helpful in remaining connected to tone production in performing.6.5/10

**Environment** - Mostly internal, some sense of audience presence but no imagery of performance space.6/10

**Task** - Clear outline. Physical@125; Imagery@110; Isolation at@110 (12pos); combined imagery/physical@110. Combining is something I've been doing throughout i.e. Playing sometimes and imaging sometimes throughout a continuous performance. For 12pos movement, it is really about coming up with a strategy of movement or a way to divide up the movement into small enough chunks that I can see clearly. After first half of RH pattern I think in groups of 2 notes (3 x 2notes) to clearly image the position shift. This is a very useful strategy for harder to visualise things. 7/10

**Timing** - Following the metronome throughout at this point. Occasionally wavers - get more intensity on time focus.6.5/10

**Learning** - Good focus on what I know. Be stricter on really preparing the image before I physically play. 6.5/10

**Emotion** - Strong connection to body involvement in sound production. 6.5/10

**Perspective** - Associated. Not much deviation. 6/10

### **23.3.11 (#25)**

#### *a finger*

**Physical** - Trying to connect full body with creating a sound helps strengthen sound production and posture.. Rotating between image, play helps to 'clean up' the movement gives it more focus. Sound quality better the more focused

the intent mentally. 7/10

**Environment** - Image Field and , briefly, a collection of players (John Williams etc) watching me do an exercise. No sense of performance space. 6.5/10

**Task** - Controlled and specific. Mind wanders and quality falls, mind focuses quality (espec. of sound) improves. 7/10

**Timing** - Following metronome with physical and mental. Race a bit when focus wobbles. 6.5/10

**Learning** - When I catch something that works better I must jump on it and get excited more consistently. 6.5/10

**Emotion** - Strong. Determined. Intensity can rise. 6.5/10

**Perspective** - Associated. Some movement to RH close up. 6.5/10

### *Piece*

**Physical** - Strong connection with sound emanating from inside my body. This makes the swelling dynamics an extremely powerful force in my body and mind. It is like NLP turning up the volume. There is a kind of kinesthetic feel to the waves of sounds. 7.5/10

**Environment** - Some imagery into a concert space and feeling the feedback from the room. Just now I'm thinking the overwhelming internal swelling is a more important connection than the physical one as it does not rely on external factors. 7/10

**Task** - Physical@125, Imagery@110, some 12pos@110. Then I wandered a bit. I can do each of the previous two for longer periods. 6.5/10

**Timing** - Good. Loss of focus equals loss of timing. 12pos was @110 today. 6.5/10

**Learning** - The internal swelling is a profoundly different performance experience. More intense and exciting. I found other polyrhythmic patterns with the RH pattern when isolating certain sections and playing against the 4 in the metronome. Very rich rhythmically for a static pattern. 7/10

**Emotion** - Probably the strongest I've had. The swelling feeling starts in the pelvis and rises, almost blinding my view of the guitar as it reaches my head. Like bobbing in the water. This thread links emotion, environment and physical very strongly. 7.5/10

**Perspective** - Associated - sort of. This bobbing thing is a different kind of perspective. There is perhaps an element of creative imagery here, where I'm inventing a sensation. This seems very effective but is not really a part of the PETTLEP guidelines (I'll check that).7/10

#### **24.3.11 (#26)**

*a finger*

**Physical** - Imagine sound from body good. Reverse picking scales really 'wakes up' the staccato technique. I can image a much more stable, robotic, technique than I can play. *m, i* fingers don't move exactly as imaged consistently. 7/10

**Environment** - No focus here today. 5/10

**Task** - Good. Stuck to metronome. Tried scales in broken 3rds - excellent coordination challenge. Pattern (staccato). Clarify balance of imagery and physical. 7/10

**Timing** - Good. Imagery (like my sight reading) often wants to slow down, to be perfect. Metronome helps me resist this 'safety' urge and image in real time.7/10

**Learning** - Sound emanating from body could be more intense. Use imagery to make it so.6.5/10

**Emotion** - Not so focused here. 5.5/10

**Perspective** - Associated. All about RH sensations. 5.5/10

*Piece*

**Physical** - Waves of sound still strong. Imagery consolidates this. Clear focus on RH string contact. Much bigger sound. Clarity fluctuates and is definitely better with clearer imagery.7/10

**Environment** - Visualised the waves of sound growing beyond my body to fill a huge performance space. This was sporadic and when focused shifted to some technical detail, the space was lost. 7/10

**Task** - Time seemed slow today (dragged). Physical @125, imagery @110. Mostly projection of sound on small sections of the chord prog. Play, vis, play vis.7/10

**Timing** - Imagery consistent. RH still fluctuates accuracy. Try fast imagery.

7/10

**Learning** - Sound growth good. Interior of RH pattern, bass notes play a melody that can be accented, as does each finger. 7/10

**Emotion** - Good, growth in sound and imagery of space (and their interaction) help emotional connection to performance. 7/10

**Perspective** - Associated. Strong. 6.5/10

### 25.3.11 (#27)

*a finger*

**Physical** - Sound from body there, less consistently conscious of it. Sluggish hands today. Nails feel inconsistent with imagery (espec *p*). 6.5/10

**Environment** - Mind wandered a bit. Sometimes Mags present. 5.5/10

**Task** - Broken 3rds, reverse scales, staccato pattern, 12 pos pattern. I have not had a clear plan on exactly when to physically play and when to visualise playing. Allows for wandering ideas, less intense focus. 6.5/10

**Timing** - Mostly with metronome @90. Can raise this to challenge and get to performance speed. I noticed in performances I lose sense of the ideal speed (125bpm). 6.5/10

**Learning** - Some important things missed (sound in body, intensity of focus, plan for use of visual/phys, environment awareness). How do I incorporate remembering this into the process? 6/10

**Emotion** - Ok. A bit sleepy today. Environment link low. 5.5/10

**Perspective** - Associated. No focused exploration here. 5.5/10

*Piece*

**Physical** - Good. Strong connection to sound. Contact good - a little less clear @115bpm. 7/10

**Environment** - Good. Varied - Field, Grigoryans watching. 7/10

**Task** - Good. @130 phys, @115 vis/phys, focus on 12pos, accenting bass notes, harmonics 7/10

**Timing** - With metronome throughout. Try more flowing as the pattern suggests. 6.5/10

**Learning** - Good incorporation of sound, environment ideas. 6.5/10

**Emotion** - Good for performance imagery. Could still be more focused,

intense.6.5/10

**Perspective** - Associated. Some movement through body to connect with sound. 6.5/10

### **26.3.11 (#28)**

*a finger*

**Physical** - Good. Conscious of posture throughout. Less connection with sound/body. Strong consistent focus throughout.7/10

**Environment** - Some sense of place, with Field watching. 6/10

**Task** - Good. Clear targets. @95 Scales/broken 3rds (naming notes throughout e.g. A dorian b2 = Bb, F#). Reverse scales (5mins) good to focus on reverse flicking motion, image, play repeat.. Staccato, after reverse scales, used creative imagery to have each finger pulled back to position either by magnetic force or string attached to finger. This helped focus, but too early to know if it improves performance. I *think* it was better, but a few days more before I judge. 7.5/10

**Timing** - Metronome, right on. Subdivided at times when trying to clarify an image.7/10

**Learning** - Good development of reverse scales and creative imagery is a good option. Left out body/sound connection. 6.5/10

**Emotion** - Determined. Positive, espec related to environment imagery.6/10

**Perspective** - Associated. Moved around, espec when imaging string/magnetic force acting on fingers. 6.5/10

*Piece*

**Physical** - Good. Connection to body/sound. Focused isolation of fingers. Sense of relationship between imagery and physical. 7/10

**Environment** - Strong. Playing for an imaged audience good. Trying to fill space e.g. VCA hall. Imagined being watched as I problem solved, helped stay on target, and determination.7/10

**Task** - Very good. Noticed that clarity problems are not with a finger at all. It is directly after. Focused imagery on this perception. Felt like a bit of a blind spot until noticed. Isolated the section and set a targeted goal to increase particular notes. 7.5/10

**Timing** - Solid. On metronome 111bpm or subdivision when necessary. 7/10

**Learning** - Very good. Found a blind spot and perceived it's source. Once identified set a goal to clarify the area and adjust. Immediate improvement, but more to do here. Good sound/body connection throughout. 7.5/10

**Emotion** -Strong sound connection and performance imagery makes it real. Focus on problem, emotions change to determination, imagining being watched keeps them present.7/10

**Perspective** - Associated. Occasional close ups of RH and imaged looking at audience of masters.6.5/10

### **28.3 11 (#29)**

*a finger*

**Physical** - Tried to even out volume between fingers especially *i* finger after *a*. Still extraneous noise during staccato. Imagery intensity needs to grow. More imagery/physical repetition. 6.5/10

**Environment** - Some sense of Ralph, Field etc looking up close at return finger movement. Not some much a space, just their presence.6/10

**Task** - Good. Clear targets. @95 Broken 3rds (scale note naming), reverse scales (clearer imagery today), staccato. Tried some magnet/string imagery, but less focused than yesterday.7/10

**Timing** - Ok attention to metronome. Too much slower subdivision today. Set challenging imagery tempos.6.5/10

**Learning** - No body/sound connection focus. Unfocussed creative imagery (magnet).6.5/10

**Emotion** - Not so involved. Some fun imaging Ralph, Field etc controlling each finger on a string.6/10

**Perspective** - Associated. Awareness of string pullers perception. 6/10

*Piece*

**Physical** - No focus on body sound connection. Image/physical good. Take time to clearly imagine many senses. Don't get trapped by the metronome to play all the time. Clearer image of *i* finger after *a*. 6.5/10

**Environment** - Some connection to performance space - recital performance. Not much though. 5.5/10

**Task** - Meandered a bit. Really take time to mentally tell myself what is about to happen. Say it in words so I have to think about it. 6/10

**Timing** - Ok. Random change of subdivisions. Plan this. 6/10

**Learning** - Good from yesterday but lost sound/body connection from prior. 6/10

**Emotion** - Not so involved. Visualising recital is exciting. 5.5/10

**Perspective** - Associated. 5.5/10

### 29.3.11 (#30)

*a finger*

**Physical** - Focused on flicking motion throughout. Staccato can be more so. Think of Field up close. 6.5/10

**Environment** - Field was watching closely on staccato. Practice room. 6/10

**Task** - Clear. @95 Broken 3rds, Reverse Scales, Staccato/prep 7/10

**Timing** - Ok. Metronome throughout. Staccato/prep doesn't need to be at speed does it? 6.5/10

**Learning** - No sound/body. No magnet/strings. 5.5/10

**Emotion** - Neutral. Focused. 5.5/10

**Perspective** - Associated. 5.5/10

*Piece*

**Physical** - Better sound/body connection. Quite dexterous today (tried @140 at end- not bad!) 7/10

**Environment** - Projection to class, Grant St ok. Still not intense images. 6.5/10

**Task** - Good. Caught myself anytime I started to wander and took up a task. 7/10

**Timing** - Good. @130/112. Faster the a finger still feels in lag. 7/10

**Learning** - Good use of flick sensation and sound/body. 7/10

**Emotion** - Involved physically with sound helps environment and emotional focus. Still not intense though. 6.5/10

**Perspective** - Associated 6/10

### 30.3.11 (#31)

*a finger*

**Physical** - Scalar stuff well focused. Good flicking motion. Some connection body/sound. 6.5/10

**Environment** - A little sense of performance/teaching space. 6/10

**Task** - Good. Clear. Time flew.7/10

**Timing** - Maybe challenge myself to push tempos espec imagery tempos. 6.5/10

**Learning** - Body/sound connection occasionally. Still too much physical - more imagery.6/10

**Emotion** - Determined. Fun. 6/10

**Perspective** - Associated. I don't think of this one very often.5.5/10

*Piece*

**Physical** - Consistent sound/body. Strong tone. Imagery clarity on tone and placement clearly improves performance.7/10

**Environment** - Various - Rock Kids(?) This proved good as the positive feelings from admiration (from band members) and feeling I was widening the world view (of students and teachers) was positive.7/10

**Task** - Clear. No meandering today. Specific tasks are key to this aspect.7.5/10

**Timing** -Always in time. Started to think about playing with metronome on other beats7/10

**Learning** - Good. Positive feedback imagery (Rock kids) is interesting. Can imaging environments with qualities I desire (admiration, helping others) improve my performance practice?7/10

**Emotion** - Connected. Sound/body and imagery came together somewhat today.7/10

**Perspective** -Associated. Kinesthetically, my perspective does change, now that I think of it, as my attention goes from the whole flow to a specific part.6.5/10

## Appendix B – Journal Scores

Sess. #	P		E		T		T		L		E		P		Average	Key
8		6		1		7		6		5		6		5	5.14	<b>Piece:</b>
10		6.5		6.5		6		6		6.5		6.5		6	6.29	High
11	6.5	6.5	6	6	6.5	6.5	6.5	6.5			6.5	5.5	6	5.5	6.21	Low
12	6	5.5	3	6	6.5	6	6.5	6	6	5.5		6		5.5	5.71	<b>a finger:</b>
13	6.5	6	6	5.5	5	6.5	5	6	5	7	4.5	6	5	5.5	5.68	High
14	6.5	6.5	6	6	6	6.5	6	6	6	6.5	6.5	6	6.5	6	6.21	Low
15	6.5	6.5	6	6	6.5	7	6.5	7	6.5	7	6.5	6.5	6.5	6.5	6.54	
16	7	6.5	6	6	7	7	6.5	6	7	7	6.5	6	6.5	6.5	6.54	
17	7	6.5	5.5	5.5	7	6.5	7	7	7	7	5.5	6	6	6.5	6.43	
18	7	7	5	7	7	7	7	7	7	7	6	6.5	6.5	7	6.71	
19	6.5	7	5	7	7	7		7	6.5	7	6	6.5	6.5	6.5	6.58	
20	6.5	7	6	7	6	6.5	7	7	7	7	6.5	7	6	6.5	6.64	
21	6.5		6		7		6		6.5		6		6.5		6.36	
22	7	7	6.5	7	7	7	7	7	7.5	7	6	6.5	7	6.5	6.86	
23	7	6.5	6.5	6.5	7	7	6.5	6.5	7	7	7	6	6.5	6.5	6.68	
24	6.5	6.5	6	6	7	7	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6	6.46	
25	7	7.5	6.5	7	7	6.5	6.5	6.5	6.5	7	6.5	7.5	6.5	7	6.82	
26	7	7	5	7	7	7	7	7	6.5	7	5.5	7	5.5	6.5	6.57	
27	6.5	7	5.5	7	6.5	7	6.5	6.5	6	6.5	5.5	6.5	5.5	6.5	6.36	
28	7	7	6	7	7.5	7.5	7	7	6.5	7.5	6	7	6.5	6.5	6.86	
29	6.5	6.5	6	5.5	7	6	6.5	6	6.5	6	6	5.5	6	5.5	6.11	
30	6.5	7	6	6.5	7	7	6.5	7	5.5	7	5.5	6.5	5.5	6	6.39	
31	6.5	7	6	7	7	7.5	6.5	7	6	7	6	7	5.5	6.5	6.61	
Av.	6.67	6.66	5.74	6.18	6.74	6.77	6.53	6.57	6.45	6.71	6.05	6.39	6.15	6.20	6.41	

## Appendix C – Before and After DVD