Contemporary Steel-String Fingerstyle Guitar:

Developing New Vocabulary and Improvisational Approaches

Volume I: Thesis

By Gary Lutton (BMus, MMus)

Faculty of Arts, Humanities and Social Sciences

Submitted for the Degree of Doctor of Philosophy

September 2019

I confirm that the word count of this thesis is less than 100,000 words

Table of Contents

1 INTRODUCTION 1

1.1 BACKGROUND AND MOTIVATION 1

1.2 PRACTICE-BASED RESEARCH 2

1.3 OVERVIEW OF THESIS 3

1.4 SCOPE OF RESEARCH 4

1.5 A NOTE ON THE TRANSCRIPTIONS AND AUDIO 5

2 LITERATURE REVIEW 7

2.1 PART 1: KEY FEATURES OF CONTEMPORARY STEEL-STRING FINGERSTYLE GUITAR ... 8

2.1.1 Overview of Contemporary Steel-String Fingerstyle Guitar 8

2.1.2 Acousticity 8

2.1.3 Extended Techniques and Percussion 9

2.1.4 Polyphony: Arrangement of Voices in Aerial Boundaries 14

2.1.5 Overview of Altered Tuning Systems 16

2.1.6 Differentiating Practices: Contemporary Fingerstyle Guitar and 'Acoustic Fingerstyle'. 18

2.1.7 Summary 19

2.2 PART 2: IMPROVISATION, COGNITION AND 'FLOW' 21

2.2.1 Section 1: Cognitive Processes of Improvisation 23

2.2.1.1 Patterns, Procedures and Schemata 24

2.2.1.2 Redundancy of Cognitive Processing Structures 26

2.2.1.3 Cognitive Constraints on Improvisational Fluency 28

2.2.1.4 Learning and Memory Systems 29

2.2.1.5 Cognition and Pedagogy 31

2.2.1.6 A Note on 'How to' Books in Jazz 34

2.2.1.7 Summary of Implications for Practice 35

2.2.2 Section 2: Flow and Music Practice 36

2.2.2.1 Overview of Flow 36
2.2.2.2 Parallel Theories and Precursors 36
2.2.2.3 The Nine Dimensions of Flow: Preconditions and Experiences 38
2.2.2.4 Attention and Effortlessness 39
2.2.2.5 Flow and Music Practice 42
2.2.2.6 Summary 45

3 OVERVIEW OF KEY INFLUENCES 46

3.1 THOMAS LEEB: ANALYSIS OF TECHNIQUES AND COMPOSITIONAL DEVICES 47

3.1.1 Guitar Techniques: Percussion and Hand Independence in Albino 47

3.1.2 Guitar Techniques: Pianistic and Vocalistic Approaches to Functional Harmonics 50

3.1.3 Arranging Techniques: Implied Polyphony in No Alibis 51

3.1.4 Compositional Devices: Ambiguity and The Single-Note Ostinato 53

3.1.5 Slipstream: Leeb's Influence in Personal Practice 56

3.2 RALPH TOWNER: ANALYSIS OF IMPROVISATIONAL APPROACHES AND HARMONIC DEVICES 60

3.1.6 The 'Spotlight Panning' Concept 60

3.1.7 Improvisational Approaches in Pilgrim 62

3.1.8 'New Age' Harmony in Beneath an Evening Sky 63

3.1.9 Linking Chord Progressions with Common-Tones in Icarus 65

4 METHODOLOGY 67

4.1 OVERVIEW AND RESEARCH QUESTIONS 67

4.2 PART 1: TELEOLOGICAL AND AUTOTELIC PRACTICE 69

4.2.1 Exploring Practice Strategies: A Biphasic Approach to Improvisation Practice 69

4.2.2 Phase 1: Teleological Practice 71

4.2.3 Phase 2: Autotelic Practice 73

4.3 PART 2: DEMONSTRATION OF TELEOLOGICAL PRACTICE 77

4.3.1 Step 1: MVCs, Specialist Memory and the Knowledge Base 77

4.3.2 *Step 2: Transposition, Variation and Schema Theory* 78

4.3.3 *Step 3: Learning Recombination Principles via Improvisatory Etudes.* 80

4.3.4 *Step 4: Practicing Improvisational Models* 82

4.3.5 *Summary* 82

4.4 PART 3: DEVELOPING THE RHYTHMIC PALETTE 84

4.4.1 *Mapping Konnakol Phrases to Percussive Guitar Techniques* 84

4.4.2 *Developments: Timbral Variations* 86

4.4.3 *Developments: Rhythmic Variations* 87

4.4.4 *Rhythmic Formulas* 88

4.5 PART 4: MUSICAL DICE GAMES 91

4.5.1 *Musical Fragment 1* 92

4.5.2 *Dimensions of Variability* 93

4.5.3 *Musical Dice Games Matrix* 94

4.6 SUMMARY OF METHODOLOGICAL APPROACHES. 97

5 ANALYSIS AND COMMENTARY 98

5.1 OVERVIEW OF CONTENTS 98

5.2 TELEOLOGICAL PRACTICE REVIEW 100

5.3 AUTOTELIC PRACTICE REVIEW 103

5.4 ASPECT ANALYSIS: DEVELOPING AN ANALYTICAL APPROACH 107

5.5 ANALYSIS OF NEW VOCABULARY AND IMPROVISATIONAL APPROACHES 110

5.5.1 *Musical Dice Games Analysis* 110

5.5.1.1 Musical Dice Games Matrix 113

5.5.2 *Harp Harmonic Technique Analysis* 117

5.5.2.1 HHT Applied to Harmonic Concepts 120

5.5.2.2 Harmonic Realisation of an Improvisational Model using HHT 124

5.5.3 *Alap Approach Analysis* 126

5.5.4 *Linear Approach Analysis* 128

5.5.4.1 Linear Pentatonics with an 'Outside' Approach 129

5.5.4.2 Linear Approaches in Practice: Tir na nÓg solo 131

5.5.5 Tripartite Approach Analysis 132

5.5.5.1 Other Tripartite Structures 134

5.5.6 Implied Polyphony and Towner's 'Spotlight Panning' Concept 136

5.5.6.1 Implied Polyphony in Tir na nÓg 138

5.5.7 Harmonic Approaches in DADGAD 140

5.5.7.1 Harmonic Etude Overview 140

5.5.7.2 Improvised Realisation of Etude 141

5.5.7.3 Improvisational Model: A Lotus on Irish Streams 142

5.5.7.4 Harmonic Vocabulary in *Lila* 144

5.6 CASE STUDY ANALYSIS: SOLO GUITAR IMPROVISATIONS 147

5.6.1 DADF#AE Improvisation 147

5.6.2 DADGAD Improvisation II 152

6 SUMMARY, CONCLUSIONS AND FUTURE RESEARCH 158

6.1 SUMMARY OF THESIS 158

6.2 ORIGINAL CONTRIBUTIONS TO KNOWLEDGE 159

6.3 SIGNIFICANCE AND IMPACT 161

6.4 FUTURE RESEARCH 162

7 BIBLIOGRAPHY 164

8 DISCOGRAPHY 172

List of Figures

Figure 1.1 Guide to submission........6

Figure 2.1 Desert Pirate........10

Figure 2.2 Desert Pirate ex. 2........11

Figure 2.3 No Alibis........12

Figure 2.4 D major scale using 'harp technique'........12

Figure 2.5 This Woman's Work........13

Figure 2.6 Aerial Boundaries........15

Figure 2.7 Day Tripper........19

Figure 3.1 Albino........48

Figure 3.2 Albino ex. 2........48

Figure 3.3 Quicksilver........50

Figure 3.4 Akaskero........51

Figure 3.5 Four voices in No Alibis........52

Figure 3.6 Implied melodies in No Alibis........53

Figure 3.7 Fishbowl (transcription by Grover)........54

Figure 3.8 Fishbowl ex.2........54

Figure 3.9 Fishbowl ex.3........55

Figure 3.10 Upside Down........55

Figure 3.11 Slipstream (transcription by Grover)........56

Figure 3.12 Slipstream ex.2........57

Figure 3.13 Slipstream ex.3........57

Figure 3.14 Slipstream ex.4........58

Figure 3.15 Slipstream ex.5........58

Figure 3.16 Towner's 'spotlight panning' illustration........61

Figure 3.17 Pilgrim........62

Figure 3.18 Beneath an Evening Sky 64

Figure 3.19 Icarus chords 65

Figure 3.20 Bm11 voicing 66

Figure 4.1 Flow dimensions and corresponding practice phases 76

Figure 4.2 MVC 1A: D major scale 78

Figure 4.3 MVC 1B: Dmaj7 arpeggio 78

Figure 4.4 MVC 1C: Dmaj9 arpeggio with harp technique 78

Figure 4.5 D major scale: modal and diatonic transposition 79

Figure 4.6 Gmaj9 arpeggio transposition and variation 79

Figure 4.7 Gmaj9 arpeggio further variations 80

Figure 4.8 Etude #2 81

Figure 4.9 A Lotus on Irish Streams ex.1 83

Figure 4.10 Konnakol development ex.1 85

Figure 4.11 Konnakol development ex.2 85

Figure 4.12 Konnakol development ex.3 87

Figure 4.13 Konnakol development ex.4 87

Figure 4.14 Konnakol ex.1 88

Figure 4.15 Konnakol ex.2 89

Figure 4.16 Model for musical dice games matrix 92

Figure 4.17 Musical fragment 1: Diabaté-style 93

Figure 4.18 Dimensions of variability 93

Figure 4.19 Further refracting pathways on dimension 1: rhythmic variation of melody 94

Figure 4.20 Musical dice games matrix: iteration 1 95

Figure 4.21 Musical dice games transcription: iteration 1 96

Figure 5.1 Teleological and autotelic practice with corresponding flow dimensions 101

Figure 5.2 Cyclical nature of teleological and autotelic practice 102

Figure 5.3 Subjective effort during performance in flow conditions 104
Figure 5.4 Development of Pressing's 'aspects' for use in analysis 108
Figure 5.5 Framework for ‘aspect analysis’ 109
Figure 5.6 Diabaté-style MVC ex.1 110
Figure 5.7 Analysis of previous figure 111
Figure 5.8 Diabaté-style MVC ex.1b 111
Figure 5.9 Analysis of previous figure 111
Figure 5.10 Diabaté-style MVC variation 1 112
Figure 5.11 Analysis of previous figure 112
Figure 5.12 Diabaté-style MVC further variation 113
Figure 5.13 Analysis of previous figure 113
Figure 5.14 Musical dice games matrix iteration 4 114
Figure 5.15 Musical dice games transcription iteration 4 115
Figure 5.16 Analysis of previous figure 116
Figure 5.17 Graphic depiction of iteration as relates to harmony, technique and texture 116
Figure 5.18 HHT MVC 1 117
Figure 5.19 Analysis of previous figure 117
Figure 5.20 HHT MVC 2 rhythmic modularisation 118
Figure 5.21 Analysis of previous figure 118
Figure 5.22 HHT MVC 2 chromatic transposition 118
Figure 5.23 Analysis of previous figure 119
Figure 5.24 HHT MVC 2 diatonic transposition 119
Figure 5.25 Analysis of previous figure 119
Figure 5.26 HHT MVC 2 modal transposition: whole-tone sound 119
Figure 5.27 Analysis of previous figure 120
Figure 5.28 Etude 1 full example 122

Figure 5.29 Analysis of previous figure 123

Figure 5.30 Harmonic structure of etude 1..123

Figure 5.31 Example of RH fingering for execution of a Cmaj9 arpeggio using HHT 123

Figure 5.32 Analysis of previous figure 124

Figure 5.33 Harmonic realisation of improvisational model using HHT 125

Figure 5.34 Analysis of previous figure 125

Figure 5.35 Alap 126

Figure 5.36 Analysis of previous figure 127

Figure 5.37 Linear approaches using superimposed pentatonics over changes to Towner's 'Icarus' 128

Figure 5.38 Analysis of previous figure 128

Figure 5.39 'Outside' linear approaches..129

Figure 5.40 Analysis of previous figure 129

Figure 5.41 Pitch-harmony analysis of fig. 5.39 130

Figure 5.42 'Outside' linear approach ex.2...130

Figure 5.43 Pitch-harmony analysis of fig. 5.42 130

Figure 5.44 Tir na nÓg: demonstration of linear approaches in general creative practice...........131

Figure 5.45 Potential for pitch and rhythm variance in tripartite approach 132

Figure 5.46 Tripartite ex.1 133

Figure 5.47 Tripartite ex.2 133

Figure 5.48 Tripartite ex.3 134

Figure 5.49 Analysis of previous figure 134

Figure 5.50 Orchard: other tripartite structures 135

Figure 5.51 Analysis of etude 3..136

Figure 5.52 Towner's 'spotlight panning' approach: etude 3...137

Figure 5.53 Levels of harmonic and melodic activity in etude 3 138

Figure 5.54 Tir na nÓg excerpt......139

Figure 5.55 Tir na nÓg interweaving melodies......139

Figure 5.56 Harmonic overview of etude 4......140

Figure 5.57 Excerpt from etude 4: chords, inversions and corresponding scalar patterns......141

Figure 5.58 Excerpt from improvised realisation of etude 4......142

Figure 5.59 Excerpt from the solo guitar arrangement of A Lotus on Irish Streams......143

Figure 5.60 Excerpt from the improvisation on A Lotus on Irish Streams (aka DADGAD Improvisation III)......143

Figure 5.61 Harmonic progression of Lila......144

Figure 5.62 Lila ex.1......145

Figure 5.63 Lila ex.2......145

Figure 5.64 Lila ex.3......146

Figure 5.65 Harmonic progression during guitar solo in Lila......146

Figure 5.66 DADF#AE improvisation ex.1......148

Figure 5.67 Pitch-harmony analysis of section A (DADF#AE improvisation)......149

Figure 5.68 DADF#AE improvisation ex.2......150

Figure 5.69 DADF#AE improvisation ex.3......151

Figure 5.70 Structural analysis of stylistic models in DADGAD improvisation II......152

Figure 5.71 DADGAD improvisation II: alap......153

Figure 5.72 DADGAD improvisation II: tripartite......154

Figure 5.73 DADGAD improvisation II: electronic (static harmony)......154

Figure 5.74 Harmonic analysis of fig. 5.75......155

Figure 5.75 DADGAD improvisation II: electronic (harmonic movement)......155

Figure 5.76 DADGAD improvisation II: folk song......156

Figure 5.77 DADGAD improvisation II: percussive Konnakol......156

Figure 5.78 DADGAD improvisation II: percussive Konnakol rhythmic groupings......157

Figure 5.79 DADGAD improvisation II: graphic depiction of development 157

List of Audio Examples (Folder A: General Creative Practice):

Audio (A) 1.1 Everywhere (Departure EP)

Audio (A) 1.2 Slipstream (Departure EP)

Audio (A) 1.3 Misty Moses (Departure EP)

Audio (A) 1.4 Slow Blink (Departure EP)

Audio (A) 2.1 This Woman's Work (Music Video)

Audio (A) 2.2 Slipstream (Live Music Video)

Audio (A) 2.3 Orchard (Music Video)

Audio (A) 2.4 Crazy Love (Live at Stormont)

Audio (A) 3.1 DADF#AE Solo Guitar Improvisation

Audio (A) 3.2 DADGAD Solo Guitar Improvisation I

Audio (A) 3.3 DADGAD Solo Guitar Improvisation II

Audio (A) 3.4 DADGAD Solo Guitar Improvisation III

Audio (A) 4.1 A Lotus on Irish Streams (McLaughlin)

Audio (A) 4.2 Tir na nÓg Introduction

Audio (A) 4.3 Orchard (Ensemble) (Live at SERC)

Audio (A) 4.4 Tir na nÓg (Ensemble) (Live at SERC)

Audio (A) 5.1 Orchard (Orchard EP)

Audio (A) 5.2 Lila (Orchard EP)

Audio (A) 5.3 Tir na nÓg (Orchard EP)

Audio (A) 5.4 Cloudbusting (Bush) (Orchard EP)

Audio (A) 5.5 Lotus Feet (McLaughlin) (Orchard EP)

List of Audio Examples (Folder B: Thesis Examples):

Audio (B) 2.1 Desert Pirate (0:16-0:25) 10

Audio (B) 2.2 Desert Pirate (1:06-1:11) 11

Audio (B) 2.3 No Alibis (2:23-2:29) 12

Audio (B) 2.4 This Woman's Work (0:38-0:51) 13

Audio (B) 2.5 Aerial Boundaries (0:32-0:38) 15

Audio (B) 3.1 Albino (0:00-0:05) 48

Audio (B) 3.2 Albino (0:20-0:25) 48

Audio (B) 3.3 Quicksilver (0:15-0:23) 50

Audio (B) 3.4 Akaskero (1:02-1:08) 51

Audio (B) 3.5 No Alibis (1:49-1:55) 52

Audio (B) 3.6 Fishbowl (0:03-0:13) 54

Audio (B) 3.7 Fishbowl (0:14-0:23) 54

Audio (B) 3.8 Fishbowl (0:54-0:59) 55

Audio (B) 3.9 Upside Down (0:23-0:30) 55

Audio (B) 3.10 Slipstream (0:29-0:36) 56

Audio (B) 3.11 Slipstream (1:02-1:09) 58

Audio (B) 3.12 Desert Pirate (G. Lutton live performance) 59

Audio (B) 3.13 Albino (G. Lutton live performance) 59

Audio (B) 3.14 Pilgrim (1:26-1:48) 62

Audio (B) 3.15 Beneath an Evening Sky (Dionys Ensemble performance) (0:14-1:05) 64

Audio (B) 3.16 Icarus (Dionys Ensemble performance) (0:22-1:50) 65

Audio (B) 4.1 Etude 2 81

Audio (B) 4.2 A Lotus on Irish Streams 83

Audio (B) 4.3 Konnakol example phrases 85

Audio (B) 4.4 Konnakol ex.1 90

Audio (B) 4.5 Konnakol ex.2 90

Audio (B) 4.6 Konnakol ex.3 90

Audio (B) 4.7 Konnakol ex.4 90

Audio (B) 4.8 Diabaté-style free improvisation........ 92

Audio (B) 4.9 Musical Fragment 1: Diabaté-style 93

Audio (B) 4.10 MDG iteration 1 96

Audio (B) 5.1 Diabaté-style MVC ex.1 110

Audio (B) 5.2 Diabaté-style MVC variation 1 112

Audio (B) 5.3 Diabaté-style further variation 113

Audio (B) 5.4 MDG iteration 4 115

Audio (B) 5.5 HHT MVC 1 117

Audio (B) 5.6 HHT MVC 2 118

Audio (B) 5.7 HHT MVC 2 chromatic transposition 118

Audio (B) 5.8 HHT MVC 2 diatonic transposition 119

Audio (B) 5.9 HHT MVC 2 modal transposition 119

Audio (B) 5.10 Etude 1 122

Audio (B) 5.11 A Lotus on Irish Streams (0:13-0:34) 125

Audio (B) 5.12 A Lotus on Irish Streams (Live at Belfast Guitar Night) 125

Audio (B) 5.13 Alap 126

Audio (B) 5.14 Alap Live Example 127

Audio (B) 5.15 Improvisation/Songbird at Edinburgh Guitar Night 2018 127

Audio (B) 5.16 Linear approach 1 (Icarus) 128

Audio (B) 5.17 'Outside' linear approach (0:09-0:14) 129

Audio (B) 5.18 'Outside' linear approach (0:27-0:34) 130

Audio (B) 5.19 Linear approaches in Tir na nÓg 131

Audio (B) 5.20 Tripartite ex.1 133

Audio (B) 5.21 Tripartite ex.2 133

Audio (B) 5.22 Tripartite ex.3 134

Audio (B) 5.23 Orchard solo section 135

Audio (B) 5.24 Etude 3 137

Audio (B) 5.25 Tir na nÓg intro excerpt 139

Audio (B) 5.26 Improvised realisation of etude 4 (aka DADGAD improvisation I) 142

Audio (B) 5.27 Lotus comparison (arrangement) 143

Audio (B) 5.28 Lotus comparison (improvisation) 143

Audio (B) 5.29 Lila (0:07-0:27) 145

Audio (B) 5.30 Lila (1:06-1:13) 145

Audio (B) 5.31 Lila (2:06-2:16) 146

Audio (B) 5.32 DADF#AE improvisation (0:20-0:29) 148

Audio (B) 5.33 (3:21-3.37) 150

Audio (B) 5.34 (4:00-4:07) 151

Audio (B) 5.35 DADGAD Improvisation II (0:00-0:13) 153

Audio (B) 5.36 (1:11-1:24) 154

Audio (B) 5.37 (3.37-3:50) 154

Audio (B) 5.38 (3:54-4:17) 155

Audio (B) 5.39 (6.10-6.23) 156

Audio (B) 5.40 (7:14-7:31) 156

Acknowledgements

I would like to thank everyone who has supported me throughout the process of writing this thesis, especially my supervisor, Professor Frank Lyons, whose guidance throughout the past four years has been invaluable.

Abstract

This thesis aims to develop new vocabulary and improvisational approaches for contemporary steel-string fingerstyle guitar. This is carried out via a practice-based investigation supported by a theoretical framework of research on the cognitive processes of improvisation and the concept of 'flow'.

A synthesis of various psychological and pedagogical concepts from the literature is used to formulate new practice methodologies termed 'teleological' and 'autotelic' practice, respectively. Teleological practice includes a step-by-step approach to generating vocabulary and developing improvisational skills. This involves the conception and practice of etudes, improvisational models, musical dice games as well as mapping Konnakol phrases to percussive guitar techniques. Due to the nature of autotelic practice, the framework is laid out but not explicitly demonstrated. Instead it is expressed through four solo guitar improvisations and a post-hoc review.

New developments in vocabulary are subsequently demonstrated through transcribed audio/video examples and analysed using an original analytical approach termed 'aspect analysis'. Key developments include the expansion of harmonic vocabulary in DADGAD, the application of the harp harmonic technique to a range of harmonic contexts, the assimilation of linear approaches in DADGAD using fingerstyle technique, the mapping of Konnakol phrases to percussive guitar techniques and the structuring of solo improvisations using various 'stylistic models'.

Glossary

Autotelic Experience: a key element of the 'flow' experience. 'Autotelic' meaning 'a self-contained goal': something that is done purely for the enjoyment of doing it and not for future rewards.

Autotelic Practice: phase 2 in the biphasic practice methodology developed in this thesis. An approach to practice that aims to facilitate flow and creativity by turning attention away from goals (future rewards) and towards the present moment.

Cognitive Redundancy: the build-up of 'extra' connections between various levels of knowledge. E.g. encoding musical objects as having (a) acoustic properties, (b) musical properties and (c) movement properties; forming associative links between them and relating them to broader conceptual structures.

Default Mode Network (DMN): a highly connected network in the brain (involved in self-reflection, episodic memory, moral reasoning, thinking about the future and many other functions) that shows higher levels when a person is *not* engaged in some specific cognitive/motor task (Sadlo, 2016, p.379). Activity in DMN reduces when engaged in activities including during flow experiences and meditation.

Deliberate Practice: a rigorous method for developing expertise in a given domain. The intended goal must be pre-established and instruction from an expert is usually required.

Effector: a part of the body (e.g. finger) that acts in response to a stimulus (e.g. a signal from the brain).

Effector independence/dependence: the adaptability of a movement to various contexts (e.g. a melodic run to various keys). A high degree of adaptability indicates effector independence. A low degree of adaptability indicates effector dependence. Rudimentary devices (e.g. a simple one-octave major scale) tend to be relatively effector independent. More sophisticated devices (e.g. a polyphonic section in a solo guitar piece) tend to be relatively effector dependent.

Flow: a feeling of total focus and effortlessness that arises in situations when challenges and skills are both high and in balance.

Generalised Motor Program (GMP): a general motor program of a given movement class that is parametrically tuneable to produce specific motor patterns. E.g. the motor patterns to play a piece of music might represent the GMP, but how fast to play it would represent a tuneable parameter.

Heuristic: a rule of thumb; a simplified directive that is imperfect but good enough for use. These are particularly useful in creative domains where the efficacy of specific actions are not known, but some general rules help to guide the process.

Knowledge Base: the useable techniques and devices that form the basis of skill or expertise.

Knowledge Compilation: the 'progressive shift from the use of declarative knowledge to that of procedural knowledge, and an increase in automaticity' (Eysenck & Keane, 2005, p. 456).

Mindfulness: non-judgmental observation, reflecting what is happening in the present moment, exactly the way it is happening, without biases (Gunaratana, 2002, p.139).

Modular Vocabulary Component (MVC): a fragment of music that can be used for the proliferation of other MVCs which can then be strung together to form larger musical structures. Similar to Berkowitz's (2010) 'formula'.

Musical Dice Games: a method of variable practice. A piece of music is composed with each bar (or fragment) comprising six possibilities. A dice is thrown to select a possibility for each bar to 'compose' various iterations.

Musical Fragment: The term given to a fragment of music in the musical dice games section in the methodology chapter. Similar to an MVC; the only difference being that a musical fragment could potentially contain multiple MVCs.

Referent: "a set of cognitive, perceptual, or emotional structures (constraints) that guide and aid in the production of musical materials" (Pressing, 1998, p.52)

Schema: a cognitive framework for the classification of things by their shared properties (rather than storing information for every single object). Similar to the concept of GMP in which a general movement class is stored rather than every possible movement variation.

Specialist Memory: domain-specific memory in which experts in a given field retain vast amounts of information by 'chunking' information into meaningful groups.

System 1: the implicit, unconscious, automatic cognitive system associated with automatic processes; for example, driving a car to work.

System 2: the explicit, conscious, effortful cognitive system associated with deliberate concentration, self-control, mental arithmetic, etc.

Teleological Practice: phase 1 in the biphasic approach to practice developed in this thesis. An approach to practice that is goal orientated and follows a (somewhat flexible) protocol laid out in the methodology chapter.

Transient Hypofrontality: a temporary lack of activity in the dorsolateral prefrontal cortex that occurs during flow activities.

Working Memory: a short-term memory store in which there is limited capacity: short-term memory recall is around 7 units (+/- 2).

1 INTRODUCTION

1.1 BACKGROUND AND MOTIVATION

I began studying contemporary fingerstyle guitar as an undergraduate at Ulster University in 2012. Eager to hone my skills I attended many residential seminars taught by the leading practitioners in the field including Thomas Leeb, Don Ross, Andy McKee and Pierre Bensusan. In 2015 I had some commercial success, winning Sky TV's *Guitar Star* and touring in the UK/Ireland and Europe with the likes of Thomas Leeb and Nitin Sawhney. In addition I signed to US-based record label *Fretmonkey Records* and in recorded my first EP *Departure*[1]. That same year I started the research process for this PhD submission.

Stylistically I had been compared to Thomas Leeb, from whom I had learned much of my vocabulary. My performances had been described as 'choreographic' denoting a particular physicality in my delivery. Indeed much of my practice consisted of repeating physical movements in a slow, controlled and flowing manner, inspired by books such as *Mastery* (Leonard, 1991) and *Just Being At The Piano* (Chase, 1981). That said, I always tried to remain sensitive to timbre, dynamic control, expressiveness and various other musical dimensions. During one of my more successful performances on *Guitar Star,* producer Tony Visconti remarked that "it's good to look at, but if you just listen, it's just beautiful music."

However, during this time my interests were expanding and I was becoming increasingly absorbed in artists such as Keith Jarrett, Ralph Towner as well Indian Classical Music and world music (as a result of my time with the Nitin Sawhney band). Many of the seminars I had attended addressed technique and repertoire, but rarely compositional or improvisational concepts. Developing new musical perspectives I felt that I needed to expand my vocabulary. In order to facilitate the rigour and scope that would be necessary to do so, I decided to undertake a PhD.

---

[1] Audio tracks: (Folder A): 1.1, 1.2, 1.3, 1.4

During the course of this research project my style has changed significantly. Much of the earlier material presented herein is comprised of solo guitar performances, still very much of the contemporary fingerstyle guitar idiom. However the later material demonstrates a development and application of the methodologies presented later in this thesis. Some is solo guitar and some is ensemble-based[2]. The idea was to retain the unique stylistic traits I had previously learned and develop them through new concepts based around the idea of improvisation.

Improvisation is what united my new musical interests and in many ways seemed to be the antidote to the pathologies that often made their way into the contemporary fingerstyle guitar idiom; a musical rigidity and an over-emphasis of technique. That said, I had little interest in 'free' forms of improvisation, more so in structured forms of skilled improvisation. In particular my curiosity was piqued by the psychology of improvisation, as well as the utility of improvisation as a tool for developing new vocabulary.

1.2 PRACTICE-BASED RESEARCH

This research aims to make contributions in terms of the creative practice itself as well as knowledge about practice. It can therefore be termed 'practice-based research' as well as 'practice-led research'. In conducting such research, appropriate methodologies must be conceived of and implemented in alignment with the research context. Haseman (2007) articulates a methodological approach that differs from the traditional quantitative and qualitative approaches. He posits a third space, labelled the "performative research paradigm" in which "research outputs and claims to knowledge [can] be reported through symbolic language and forms specific to their practice" (p. 148). The research outcomes, therefore, are expressed in domain-specific language and not necessarily in words. Words can describe, explain and analyse the research outcomes, but the practice enacts them, hence *performative* research paradigm. The research herein is practice-based in the sense that it (1) addresses a set of problems that arise from practice, (2) directly serves the needs of practice and (3) articulates solutions to the problems in the form of practice.

---

[2] The ensemble-based performances and recordings are with Dionys Ensemble – a group that I formed in late 2018 comprising two guitars, bass, violin and percussion.

1.3 OVERVIEW OF THESIS

Literature Review Part 1: An overview of the key features of contemporary fingerstyle guitar demonstrated through examples from key practitioners and supported by relevant literature.

Literature Review Part 2: A review of psychological literature on improvisation, cognition and flow comprised of two sections: 'Cognitive Processes of Improvisation' and 'Flow and Music Practice'.

Overview of Key Influences: an overview and analysis of the stylistic tendencies of two key practitioners: Thomas Leeb and Ralph Towner. Leeb's work is representative of the contemporary fingerstyle guitar idiom; Towner's work represents some of improvisational approaches and harmonic vocabulary to be assimilated later.

Methodology: includes the formulation of research questions and unique methodological approaches. Two core methodological approaches are conceived in what is termed a 'biphasic approach'. Phase 1 is termed *teleological practice*. Phase 2 is termed *autotelic practice*. The remainder of the methodology is a demonstration of various teleological approaches. Because of the freer nature of autotelic practice it was not given a 'protocol' as such. It is expressed in the solo guitar improvisations as well as the 'autotelic practice review' in the next chapter.

Analysis and Commentary: a post hoc review of both teleological and autotelic practice is carried out. A unique analytical approach is developed and termed 'aspect analysis'.

The main analyses are categorised by stylistic model and/or approach (e.g. musical dice games, harp harmonic technique, implied polyphony etc.). Finally, two case studies of solo guitar improvisations are presented as instances of autotelic practice, simultaneously demonstrating the efficacy of the overall methodological approaches.

Summary, Conclusions and Future Research: a summary of the thesis is presented followed by the key contributions to knowledge, the significance and impact of the work and recommendations for further study.

1.4 SCOPE OF RESEARCH

There are vast amounts of pedagogical texts on jazz improvisation, many of which proved useful throughout this research process. Texts such as *Advanced Jazz Guitar Techniques* (Greene, 2004)*,* *Ready, Aim, Improvise* (Crooke, 1999), and *The Classical Guitarist's Guide to Jazz* (York, 2011) provided key insights into the world of jazz improvisation. That said, there was a deliberate attempt to steer the focus away from jazz pedagogy and practice, towards psychological research and its application. Jazz pedagogical texts tended to focus on linear improvisations in an ensemble context and thus had limited application for this research. Taking a psychological approach, however, enabled the development of a domain-general framework for improvisation that could be applied to existing vocabulary. So while reference is made to various jazz-related materials, the vocabulary and improvisatory approaches herein do not exclusively conform to those found in common forms of jazz.

Finally, research on flow and creativity is used to construct a 'biphasic approach' to practice in the methodology chapter. This is done with the knowledge that research in these areas is often unclear and sometimes contradictory. Cseh (2016), for example, has highlighted potential theoretical conflict in flow research as it relates to creativity, noting that there may be important differences between creative activities and those commonly used in flow-related experiments such as video gaming (p.80). However, the biphasic approach is not intended to be an algorithm for creativity, but rather a set of heuristics that allow for (mostly) effective action in the face of uncertainty.

1.5 A NOTE ON THE TRANSCRIPTIONS AND AUDIO.

Transcriptions are used to highlight certain aspects of a particular section and therefore may omit certain information not deemed relevant to the analysis. For the most part tablature and staff notation are used in conjunction, though occasionally they are used in isolation. Some of the improvised material presented in the latter stages of the thesis were recorded and transcribed months later and therefore the fingering may not be totally accurate. Further, many of the improvisations are carried out in 'free time' and therefore rhythms were estimated rather than strictly imposed. Full transcriptions of all relevant materials are included in a separate document entitled **Volume II: Transcription Portfolio**.

Audio/video examples are included on a separate USB drive in three separate folders: A, B and C. Some examples are professional quality recordings; others are home recordings or live recordings.

Folder A contains key material relating to general creative practice; that is key audio/video examples that are not exclusively thesis materials. This includes two publicly available CDs (one solo and one ensemble), a small sample of music videos, live performances and home recordings as well as four solo guitar improvisations. All material was recorded from 2016-2019 giving a general overview of my creative practice during this time.

Folder B contains all audio/video examples demonstrated in this thesis, as well as some further examples. They are categorised by chapter heading: e.g. 'audio track: (B) 2.1' will be the first audio track in chapter 2.

Folder C contains the audio/video counterparts to Volume II: Transcription Portfolio. Much of this material will have been covered in the thesis (folder B), however, further examples will be given. Additionally, audio will be grouped and presented in terms of its function: i.e.

‘etudes’, ‘solo guitar improvisations’ etc. rather than adhering to the narrative of the thesis (as in folder B).

Therefore, there is significant cross-over between each of the folders. However, they are organised to each serve a different function. For example, folder A could be listened to first, to get a general overview of practice from 2016-2019. Then folder B could be used as a companion to the thesis. Finally, folder C could be used as a companion to the transcription portfolio:

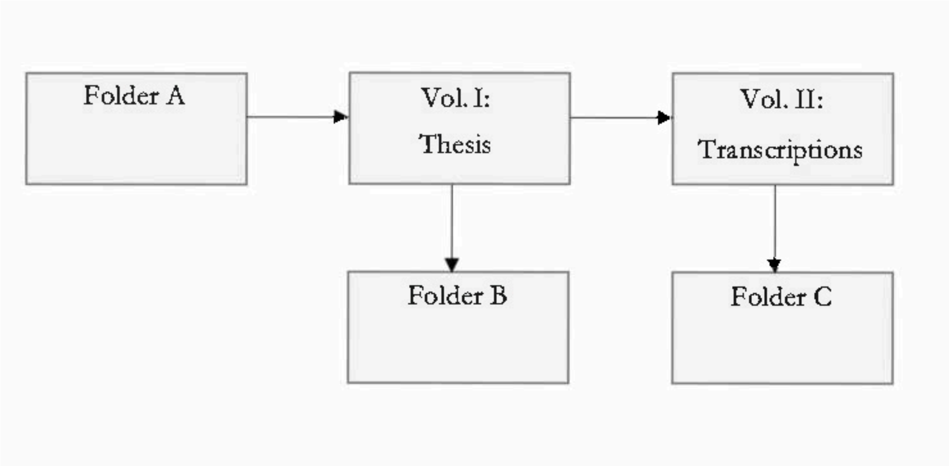

Folder A
Vol. I:
Thesis
Vol. II:
Transcriptions
Folder B
Folder C

Figure 1.1 Guide to submission

2 LITERATURE REVIEW

A core methodological approach of this thesis is the re-assimilation and development of contemporary fingerstyle guitar vocabulary by applying improvisatory concepts. Therefore a bipartite literature review was carried out. **Literature Review Part 1** overviews contemporary fingerstyle guitar by identifying key features of the idiom. **Literature Review Part 2** explores key psychological literature with direct pragmatic utility for the development of improvisational abilities. This is presented in two parts: (1) Cognitive Processes of Improvisation and (2) Flow and Music Practice. Together these supply the framework for the methodology chapter in which improvisational practice strategies are devised and improvisational concepts are applied to contemporary fingerstyle guitar vocabulary.

2.1 PART 1: KEY FEATURES OF CONTEMPORARY STEEL-STRING FINGERSTYLE GUITAR

2.1.1 Overview of Contemporary Steel-String Fingerstyle Guitar

This section identifies and explores the key features of contemporary fingerstyle guitar. Notated examples from Thomas Leeb, Michael Hedges and others are used throughout to highlight each of the key features. However, a more in-depth analysis of key influences is carried out in the *Overview of Key Influences* chapter.

Fingerstyle is a broad term that denotes playing the guitar with the fingers of the right hand (as opposed to a plectrum). What is explored herein is a specific variety of fingerstyle with several defining characteristics developed by guitarists such as Michael Hedges and Thomas Leeb. Key features of the idiom include (1) acousticity, (2) use of extended techniques and percussion, (3) polyphony and (4) use of altered tuning systems. Each will be explored in turn.

2.1.2 Acousticity

The use of the *acoustic* guitar is absolutely necessary to the practice. On a sonic level, the resonances/overtones produced from an acoustic guitar are much richer than those produced by an electric guitar. Furthermore, Eric Roche (2004) in his widely-read textbook *The Acoustic Guitar Bible,* suitably correlates the body of an acoustic guitar with that of a drum. He notes that the bracing on the soundboard is tuned much in the same way that a drum-skin is, that “[t]he soundboard has to be flexible enough to respond to the loudest and deepest frequencies and sensitive enough to amplify the slightest string noise and overtone” (p.179). This 'flexibility' and 'sensitivity' associated with its construction is integral to the practice; players feature these elements, even building compositions and musical ideas around them. Indeed the practice can somewhat be defined by its acoustic nature, but also by some degree of 'acousticity': a neologism carrying cultural connotations as well as sonic. The intimate nature to the practice in many ways opposes ideas of stardom, glamour or fame associated with other forms of guitar-centric music. It is usually performed solo and it is somewhat of a convention among performers to play their encore or finale 'unplugged', dissolving the barrier between performer and audience.

Dawe & Bennett (2001) comment on the “cultural constructions” of the acoustic guitar as the binary opposite of the electric guitar: “acoustic guitars were seen as 'authentic', 'real', 'true', 'democratic' and 'close to nature' and as 'sites of resistance' to a technocratic society as represented by the electric guitar” (p.5). Although the dichotomisation of electric and acoustic guitars as binary signifiers is overly simplistic, the point remains. The acoustic guitar carries with it a sense of the *personal voice* of the performer. The player has physical contact with the strings and the production of sound is unmediated through bows, hammers or electronics (though obviously not the case in amplified contexts). Therefore it seems the acoustic guitar is one step removed from the voice in terms of unmediated personal expression.

There is, of course, an electronic dimension to the practice: amplification is generally required if only for volume. Certain electronic enhancements are common, including digital reverb, and the use of an *octaver* (popularised by guitarist Jon Gomm). The octaver mimics a bassist by reproducing the first octave of the guitar a further octave below. However, rather than ‘electrify’ the sound, these effects often function to preserve or enhance natural acoustic properties at higher volumes and in various environments. Reverb artificially reproduces the qualities of particular spaces and the octaver artificially reproduces a bass accompaniment.

2.1.3 Extended Techniques and Percussion

Most of the extended or non-conventional techniques used by contemporary fingerstyle guitarists have been borrowed from previous conventions and developed in a unique way. For example, both flamenco guitar music and blues guitar music feature percussive elements, but not to quite the same extent. Their function in flamenco is often gestural, rather than structural, while in blues they often remain relatively unsophisticated. In contemporary fingerstyle guitar, percussion (when employed) is generally not viewed as an afterthought with some tangential function but is often integral to, or even the cornerstone of a musical idea. Seminal guitarist, Michael Hedges expressed this when he declared "[m]y slaps, strange plucks and taps are not decoration or glitter. They have a structural or phrase-defining purpose." (Hedges, Stropes, 1995 p.24). Consider the sophistication of Thomas Leeb's *Desert Pirate* for example:

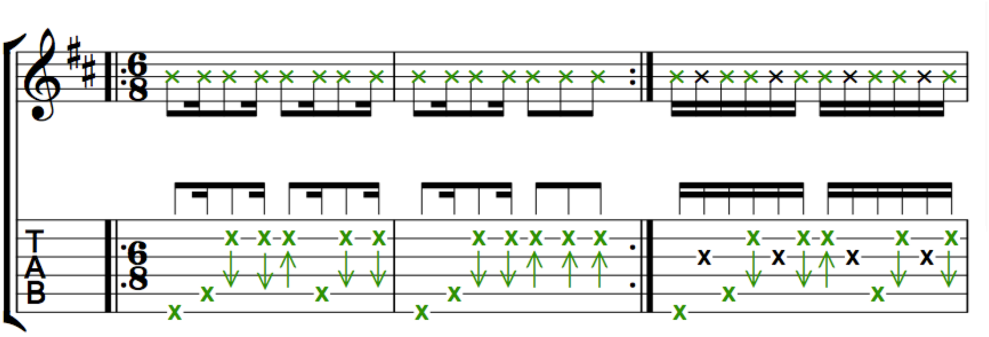


Figure 2.1 Desert Pirate

Audio (B) 2.1 Desert Pirate (0:16-0:25)

The 'x's in green, denote percussion played with the right hand, while 'x's in black denote percussion played with the left. 'X's on different strings correspond to different percussive events, for instance an 'x' on the second string denotes a scratch with the fingernail on either a 'scratch pad' or worn part of the guitar[3] and the direction of scratching is indicated with an arrow.

This piece involves polyrhythmic elements when viewed as isolated left and right-hand rhythms. The right-hand assumes the main rhythmic motif (bars 1-2) and is accompanied by an off-beat counter-rhythm (bar 3) in dotted quavers. In the performance notes for the tablature for this piece Leeb acknowledges his teachers of Ghanian music, reflecting on the "interwoven, polyrhythmic patterns that fit together like dove-tail joints" (Leeb, n.d. p.7). The initial section of

---

[3] A 'scratch pad' is an additional piece of wood taped to the guitar with the main function being to scratch with the fingernails.

Desert Pirate is entirely percussive, though later sections feature the introduction of pitch materials. The arrangement is highly meticulous to allow for certain notes to resonate and others to be muted, meanwhile facilitating the established percussive framework:

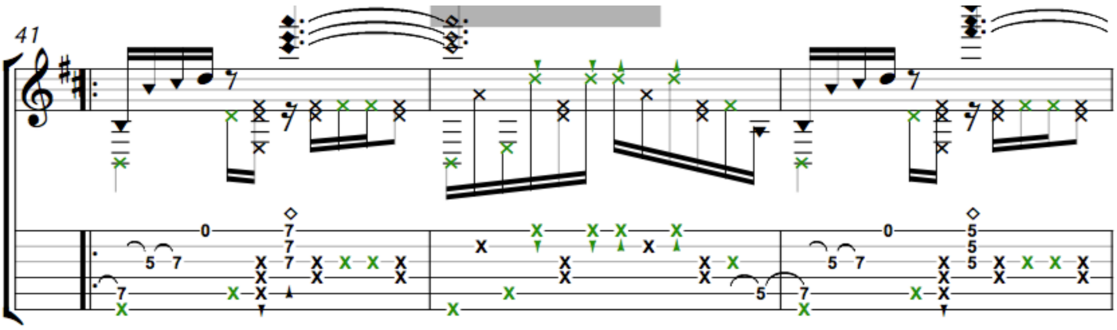

Tuning: BEDF#AD

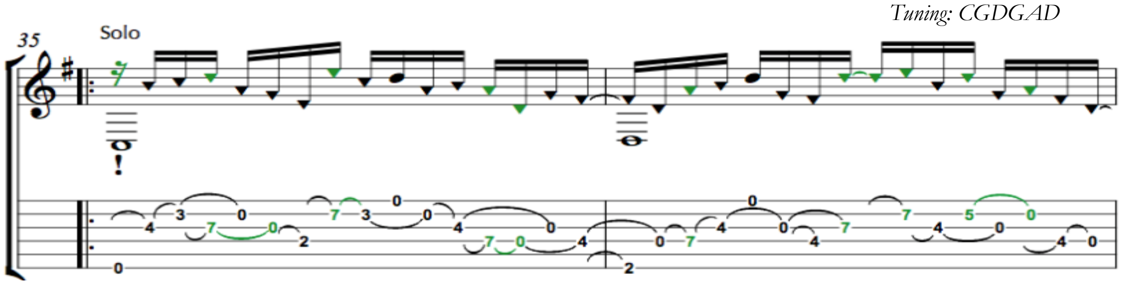
Figure 2.2 Desert Pirate ex. 2

Audio (B) 2.2 Desert Pirate (1:06-1:11)

A second extended technique ubiquitous in the practice is the use of 'tapped' notes. These are played with a single hand (either left or right), thus eliminating the need for two hands to play a single note. One motion acts as both note selector and note generator.

Two separate parts can then be executed by each hand, similar to an approach that might be used by a pianist. As Alex De Grassi (2012) discusses, however, "[a] major challenge for tapping on an acoustic guitar is to produce sufficient volume and quality of tone that integrates seamlessly with conventionally plucked notes and other techniques" (p.175) Tapped notes are limited in terms of timbre and volume as the threshold for the velocity with which the string can be tapped is significantly higher than that of a picked string. The string is hammered against the metal fret and thus the tone can be brittle, often accompanied by 'back buzz' (the posterior length of the string vibrating against the frets). That said, two handed tapping can be used to great effect. Consider the following example of a tapping section from Thomas Leeb's *No Alibis:*

Tuning: CGDGAD



Green = right hand. Black = left hand

Figure 2.3 No Alibis

Audio (B) 2.3 No Alibis (2:23-2:29)

Leeb uses two-hand tapping here in conjunction with open strings to facilitate easeful transitions between positions. Further, he employs a technique termed 'cross-stringing', 'harping' or 'campanella fingering' in which a player "distribut[es], as much as possible, the notes of a melody over the different strings, and holding the successive fingerings in order to prolong the resonance of each of the strings" (Bensusan, 1985, p.28). For example, a D major scale, played with harp technique could look like this:

Tuning: DADGAD

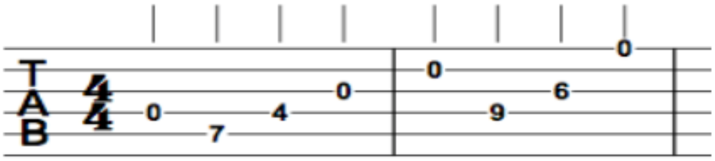


Figure 2.4 D major scale using 'harp technique'

The final extended technique ubiquitous in the practice is harmonics[4]. Harmonics have many functions including: extending the upper range of the instrument; increasing sustain; avoiding intonation problems associated with fretting notes on the upper range; allowing access to notes not physically possible in certain positions (i.e. if the player is fretting a bass note or chord at the bottom end of the fretboard and wishes to play a high-pitched melody note); and attaining bell-like, sparkling textures in ways that are often conducive to mimicking the human voice. The following example is the opening line to my own arrangement of the Kate Bush song *This Woman's Work:*

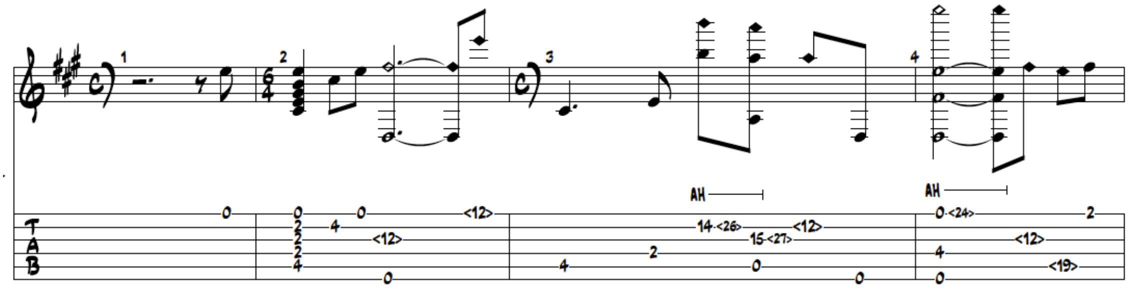

Tuning: DADF#AE

Figure 2.5 This Woman's Work

Audio (B) 2.4 This Woman's Work (0:38-0:51)

The first four notes of the vocal melody are played conventionally, and the next seven are played as either artificial (fretted) harmonics or natural (open harmonics) with one 'decorative' harmonic (the '24' on the first beat of the last bar).

---

[4] Harmonics aren't necessarily extended techniques, though often the way they are used in CFG can be considered extended. For example, harp harmonics, slide harmonics, bent harmonics etc.

2.1.4 Polyphony: Arrangement of Voices in Aerial Boundaries

As exemplified in every musical example so far, polyphony is a defining characteristic of the practice. Playing multiple parts at once or taking a 'multi-voice' approach is probably one of the most striking aspects, in that the performer conjures more voices from the instrument than one might think possible (or that at least in doing so, the performer exhibits a high degree of technical skill and virtuosity). In an article entitled, *Music, Multimedia, and Spectacle: The one-man band and audience relationships in the digital age* (Whittam, 2013) the author states that "what makes [one-man-bands] interesting is seeing rather than hearing several instruments played simultaneously." (p11). It would seem that the reverse is true for contemporary fingerstyle guitar: part of the appeal is hearing several voices being played at the one time, by the one performer. It may seem that the performer is going beyond their physical means or using some trick but it is largely a result of careful arrangement of voices; of making it seem like there are more than six strings or two hands.

Eric Roche (2004) used an orchestra analogy to illustrate how a player might approach the arrangement of voices. He advocated attempting to recreate the timbre and dynamics of various sections of the orchestra with "each [section] playing an independent part but coming together in a symphony" (p.75).

Michael Hedges' compositions were notoriously meticulous in their arrangement, with the Stropes' transcriptions denoting the exact duration of every note in a composition. His seminal work *Aerial Boundaries* is exemplified in fig. 2.6 below.

Tuning: CCDGAD

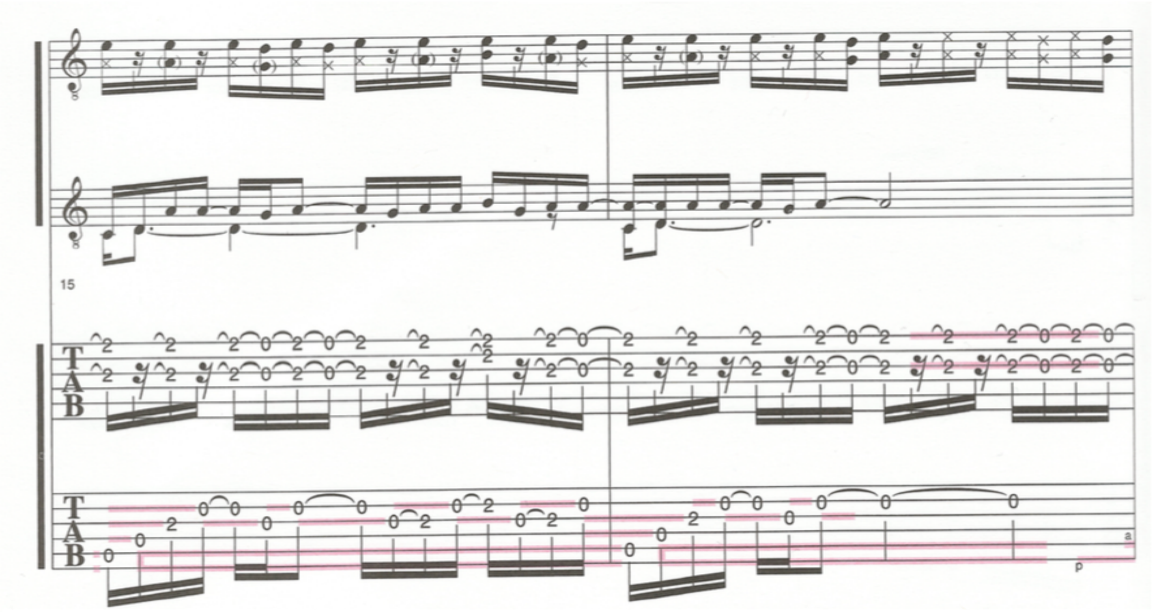


Figure 2.6 Aerial Boundaries

Audio (B) 2.5 Aerial Boundaries (0:32-0:38)

This example is one of the clearest for portraying multiple voices in notated format (transcribed by John Stropes, 1996). Each stave represents not only each 'internal voice' but both left and right hands respectively.

Left hand (top stave): follows a repeating pattern of fifths, hammering on at the 2nd fret and, when applicable, pulling off to open strings ('g' and 'd' respectively). It assumes all control over phrasing, governing attack, dynamics and articulation, and functions both as the note *selector* and note *generator*. This results in a distinct timbral separateness from picked notes as well as facilitating easeful execution of an autonomous internal dynamic arc. This independence allows for phrases to lie submerged within the texture or, in contrast, distinguish themselves as the centrepiece.

Right hand (bottom stave): has a similar autonomy however is more elaborate in function. Interestingly the right hand assumes most of the melodic material in that only the open 4th string (d) is sustained as a drone – the rest have a distinct melodic function. Additionally, the extensive use of right hand string stopping demonstrates Hedges' sensitivity to note duration and decay – the pink lines indicate instances where the fingers rest on corresponding strings, muting them. This not only clarifies melodic statements but facilitates muted percussive sounds at points of convergence with the left hand.

In the final two beats of Fig. 2.6 the right hand has generated a sustained harmony on open strings (4th and 2nd) while resting on and muting the other four strings. This occurs simultaneously with the left hand 'tapping' resulting in a driving rhythmic pulse (the pulsing effect is generated by muting the strings with the right hand together with the textural variations associated with 'hammering on' and 'pulling off' on the left hand). Other points of convergence occur frequently on the 3rd string as melodic notes coincide with the oscillating left hand pattern. This is an example of how the left hand part can be submerged within the texture – it *becomes* the melodic sequence and as such is temporarily unrecognisable as its own statement. When coupled with separate internal dynamic arcs, interweaving the voices as such forms a rich multi-dimensional texture – a texture which is fundamental to the aesthetic of *Aerial Boundaries* and many subsequent works in the same vein.

2.1.5 Overview of Altered Tuning Systems

Essential to the contemporary fingerstyle guitar idiom is the use various tuning systems known as “altered” tunings. De Grassi (2012) proposes various reasons for why one might retune the guitar including access to open strings, new chord voicings, juxtaposition of certain groups of notes, sonic textures and increased resonance. “Retuning the guitar” he declares “provides an opportunity to explore and make new discoveries, and perhaps a chance to escape the conventions of what we already know” (De Grassi, 2012, p.125). Hedges (1995) articulates a more fundamental reason for the use of altered systems:

> I approach each composition from a different vantage point. The tuning is the main symptom of an evolving harmony. If a certain musical event is going to be the cornerstone of the music and its development, why not make it easily executable on the guitar? (p.27)

Therefore, altered tunings simply *make something easier* and/or *make something possible*. A composition in D major will clearly be made easier by a tuning system based on D major. If the guitar is tuned to open D (*D-A-D-F#-A-D*) every open string and their first three overtones are diatonic to D. In practical terms, all open strings (as well as octave harmonics located at the 12th and 5th frets, and compound fifth harmonics located at the 7th and 19th frets) will be diatonic.

Two further advantages may be considered. One is that altered systems can be used to increase resonance and sustain. Melody notes, for instance can be (predominantly or exclusively) achieved on open strings or harmonics, creating resonating cascades and lyrical melodies. The second is that the open strings of an open system will sympathetically resonate when corresponding pitches (or related harmonics) are sounded. Much like the sympathetic strings of the sitar, rich overtones emerge from the instrument generating a vibrant, dimensional texture that is often not possible in standard tuning. Below is a brief overview of common and not-so-common tunings used in contemporary fingerstyle guitar.

An *open tuning*, is a specific form of altered tuning that produces an identifiable chord when all open strings are sounded together. An example of this could be *D-A-E-F#-A-E* resulting in a Dadd9 chord. Roche, however, limits the category of open tunings to when the notes of the open strings form a major triad (Roche, 2004, p.156). For the purposes of this research 'open tuning' will refer to any system that produces an 'easily identifiable' chord when the open strings are sounded. This includes minor chords and their extensions which Roche categorises as “cross-note tunings” (p.166). *Modal tunings* are a “family of altered tunings [that] are more flexible than open tunings” (p.160). They are characterised by a lack of major or minor thirds and their inversions (major and minor sixths). These accommodate easeful playing in more than one key. For example the common modal tuning of *D-A-D-G-A-D* can be fully exploited in the keys of C, G, D, F, Bb. Open and modal tunings contribute to much of the contemporary fingerstyle guitar repertoire. However, there is another category which Roche simply terms, "radical tunings" (p.166). These are unique tunings created for specific musical ideas. They do not produce a clearly identifiable chord, nor are they necessarily modal. Michael Hedges, considered to be *the* pioneer of the style, was an enthusiastic proponent of these radical tuning systems, taking influence from Joni Mitchell and Nick Drake who "rarely used the same tuning twice in their recording career" (Roche, 2004, p.166). In a 1998 documentary entitled *The Artist's Profile: Michael Hedges,* Hedges explains the rationale behind these tunings:

> [...] the music has no specific form. The guitar does. So in order to fit a form of music that maybe standard tuning or a standard instrument won't [accommodate], you've gotta' change something about the guitar […] this is to accommodate the music. (Hedges, 1996, The Artist's Profile)

2.1.6 Differentiating Practices: Contemporary Fingerstyle Guitar and 'Acoustic Fingerstyle'

It is not conducive to my creative practice to circumscribe boundaries around contemporary fingerstyle guitar or any other genre. In fact it is my intention, through this research, to go beyond any such circumscription which may currently limit my practice. That said, it may be useful to draw some distinctions between what is conceptualised herein as contemporary fingerstyle guitar, and other, similar practices. In particular, a practice that might be termed *fingerstyle guitar* or *acoustic fingerstyle,* championed by artists such as Tommy Emmanuel.

This style is somewhat of a predecessor to contemporary fingerstyle guitar and shares many of the same elements. Polyphony, for example, is a prominent feature in acoustic fingerstyle often consisting of two distinct voices: a bass line and a melody line. Consider the following example of Tommy Emmanuel's arrangement of *Day Tripper*.

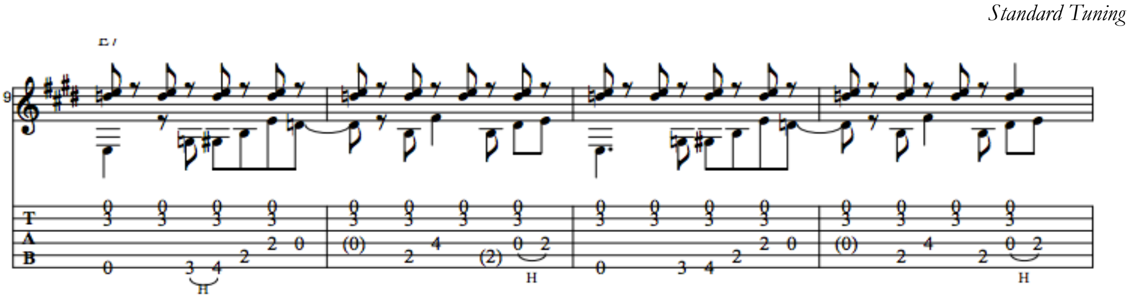


Figure 2.7 Day Tripper

This is very clear example of two distinct voices working simultaneously. However, there is no evidence of 'convergence' as was observed earlier in Hedges' *Aerial Boundaries.* Admittedly, Emmanuel's compositions are usually more sophisticated than this example might convey, but the point remains. Contemporary fingerstyle guitar often takes a more impressionistic approach to the arrangement of voices; what is termed *implied polyphony* in the next chapter. Acoustic fingerstyle often takes a more traditional approach, drawing influence from ragtime, country, blues, jazz and rock. Contemporary fingerstyle often concerns itself less with traditional musical forms and more-so with textures, atmospheres and the development of techniques and ideas – probably why Hedges was so drawn to minimalism[5] (evident in the example of A*erial Boundaries*).

2.1.7 Summary

In summary, four key characteristics of contemporary fingerstyle guitar were identified as follows: (1) acousticity, (2) use of extended techniques, (3) polyphony and (4) use of altered tuning systems. Key extended techniques such as body percussion, two-hand tapping, harp technique and harmonics were demonstrated with examples by Thomas Leeb, Michael Hedges and others. This overview serves as the foundation for the *Overview of Key Influences* chapter in which a more detailed analysis of Leeb's work is carried out with the intention of highlighting the specific aspects which I have absorbed into my own practice.

---

[5] Hedges notes that the music of Aerial Boundaries is a minimalist piece in the style of Reich and Philip Glass, and is unique only by the fact that all parts are played on one guitar: https://www.youtube.com/watch?v=6kJ-G8GW0UA&ab_channel=Andr%C3%A9sRojas

2.2 PART 2: IMPROVISATION, COGNITION AND 'FLOW'

Improvisation is of particular interest to this research as a tool for creativity and as a vehicle for the experience of *flow*. Rather than engage in a detailed discussion of the nature of musical improvisation, this section will explore key psychological research which has direct pragmatic utility for the development of an appropriate methodology. Broader discussion on improvisation can be found in Berliner's *Thinking in Jazz: The Infinite Art of Improvisation* (1994), Bailey's *Improvisation: Its Nature and Practice in Music* (1980) and Nettl's *In the Course of Performance: Studies in the World of Musical Improvisation* (1998).

Section 1 is entitled *Cognitive Processes of Improvisation* and intends to highlight the general cognitive/motor skills involved in improvisation, stripped from the specificities of a given musical language – e.g. jazz, flamenco, or Hindustani classical music. The idea is that the knowledge generated therein can be applied to *any* musical language, including that of contemporary fingerstyle guitar, and thus provide a map for developing new improvisatory vocabulary.

Section 2 is entitled *Flow and Music Practice* and explores the relationship between the phenomenon known as *flow,* and music improvisation practice. Flow is specified due to its potential utility in the improviser's practice room – an area of study with almost no literature. This lays the foundation for the development of a biphasic practice methodology in the next chapter.

Improvisation is defined herein as an interactive process between a performer (or performers) and a given *domain*: a musical model acting as a 'creativity language'. 'Free' forms of improvisation are not of interest to this thesis. Rather it is assumed that improvisation uses a pre-existing language that has been developed through years of learning and development. Sawyer (2012) in his book *Explaining Creativity: The Science of Human Innovation* illustrates this point with an analogy from Immanuel Kant:

> The light dove, in free flight cutting through the air the resistance of which it feels, could get the idea that it could do even better in airless space (p.265)

Sawyer's point is that the innovator creates *with* a given language and not in spite of it. Traditions, forms, structures, rules are his allies. He develops, expands and synthesises existing models to create novelty and value. The following research adopts this notion of creativity and applies it to improvisation. The vocabulary demonstrated in this thesis is largely a result of the development and synthesis of pre-existing vocabulary in novel ways.

2.2.1 Section 1: Cognitive Processes of Improvisation

The ensuing section operates under the premise that improvisation is a skill that can be learned through deliberate practice (Pressing 1998, Ericsson, Krampe, Tesch-Romer, 1993). Vast amounts of pedagogical texts are available on improvisation, however they are problematic in a number of ways. Most are domain-specific as their content is deeply idiomatic and thus non-transferrable. Works in jazz pedagogy (e.g. York 2011, Crook 1999, Greene 2004) almost exclusively focus on linear improvisation-as do the majority of academic works in the same vein as the current study (e.g. McKnight, 2012, Williams, 2017). Pedagogy that deals with polyphonic and/or solo improvisation also tends to be highly domain-specific (e.g. Czerny, 1983/1836). Such texts are of limited value and domain-general inferences are made with caution.

In view of this, a review of psychological perspectives is carried out with the aim of providing a domain-general schema that abstracts improvisatory principles and their implementation. A domain-general schema of improvisation is one that can be applied to any idiom with an established vocabulary. Extensive research on improvisation and cognition has been carried out by Pressing (1984, 1987, 1998), Johnson-Laird (2002), Berkowitz (2010), Goldman (2012, 2013) and Norgaard (2014) which is later used in the *Methodology* chapter to develop new vocabulary and improvisational approaches.

The subsequent section will complement this by exploring the relationship between flow and music improvisation practice. This two-part approach is a result of Csikszentmihalyi's argument that "structural models of cognition" have neglected the "energistic" dimension: i.e. affect and motivation (Csikszentmihalyi, 1988, p.159). Therefore this research aims to integrate cognitive research with the latest research on flow towards a more holistic model of the psychology of improvisation that has practical utility.

2.2.1.1 Patterns, Procedures and Schemata

A prominent theory of improvisational behaviour is that it is pattern-based; a stringing together of pre-learned motives or events. Norgaard (2014), for example, demonstrated that the majority of Charlie Parker's vocabulary consisted of patterns that were reused throughout his solos.[6] Indeed many theorists subscribe to this notion (Pressing 1987, Norgaard 2014, Goldman, 2013). This being the case how does one account for novelty? It seems that novel behaviour emerges in two ways: by stringing together stored patterns in unique ways, and by mutating existing stored patterns. If patterns can be mutated and adapted to novel environments, it would appear that stored motor patterns have a degree of flexibility. For example it is unlikely that an improviser stores motor programs for every single pattern produced during improvisations[7] but rather that they adapt existing programs in response to creative impulses and environmental demands.

The issue is addressed in Schmidt's (1975) seminal work *A schema theory for discrete motor skill learning.* He suggests that motor skill learning can be explained in terms of a schema[8] in which the structure of a given movement *class* is generalised and abstracted. Execution of a motor task utilises this schema and applies *parameters* relevant to the current situation. The relative structure is termed *generalised motor program* (GMP) and the variable parameters are termed *recall schema.* Invariants (GMP) include sequencing of events, phasing (relative timing) and relative force. Variants (parameters) include absolute timing, absolute force and effectors[9] used. Motor responses, from this view, aren't the result of something completely novel nor are they the result of something completely pre-programmed. Schmidt exemplifies this in terms of throwing a ball:

---

[6] Norgaard (2014) analyzed a corpus of 48 transcriptions of Charlie Parker solos to determine the extent that Parker employed repeated patterns. The original sample (O) was contrasted with two other control samples: a randomized sample (R) and a computer generated sample (C). The results indicate that Parker uses more patterns than random and computer generated algorithmic control samples when a pattern is defined as occurring two or more times: 82.6% of notes in the original sample (O) began a pattern vs 60.1% (R) vs 52.2% (C). However, when the pattern is defined as occurring 10 or more times, Parker *vastly* exceeds control samples: 48.5% (O) vs 6.1% (R) vs 7.2% (C).

[7] See "the storage problem' in Schmidt (1975) *A Schema Theory of Discrete Motor Skill Learning*

[8] Schema: a cognitive framework for the classification of things by their shared properties.

[9] Effector: a part of the body (e.g. finger) that acts in response to a stimulus (e.g. a signal from the brain).

> […] a motor program for throwing a ball could be modified by specific instructions to throw fast or slow. These specifications can be thought of as parameters that can be varied before the movement begins to enable the execution of the program at a different speed, a different force, and so on. Thus the performer's problem in choosing a movement is the determination of the response specifications that will modify the existing stored motor programs. (Schmidt, 1975, p.232)

Schemata develop when multiple variations of the same general type are practiced, thus allowing for the abstraction of commonalities. The strength of the schema is directly correlated to the amount of specific movement variations executed and the precision and proximal timing of feedback. Shea and Wulf (2005) suggest that, in practice, the GMP should be instantiated first, with parameterisation integrated later. It seems a stable GMP must be in place to allow for clear instructions on how to establish parameter rules. Simultaneous practice (of structure and parametrical variation) results in disrupted GMP learning (p.95). Therefore constant practice of an initial movement should take precedent, with variable practice ensuing later to enable parameterisation.

Finally it is important to note that effector independence[10] is only associated with simple tasks learned in short periods of time. Park and Shea (2003a) for example, found that increased practice resulted in more refined movement sequences but less adaptability in effector transfer tests. Complex tasks that require technical proficiency (e.g. during improvisation) indicate greater effector dependence. Therefore it should not be expected that fast or technically demanding sequences be transferable to novel environments. This is supported by Goldman (2012) who demonstrated that expert-level jazz pianists used less variation and more diatonic notes when asked to improvise in an unfamiliar key versus a familiar key. In other words pianists were unable to transfer any relatively sophisticated sequences to unfamiliar situations.

---

[10] Effector independence/dependence: the adaptability of a movement to various contexts (e.g. a melodic run to various keys). A high degree of adaptability indicates effector independence. A low degree of adaptability indicates effector dependence. Rudimentary devices (e.g. a simple one-octave major scale) tend to be relatively effector independent. More sophisticated devices (e.g. a polyphonic section in a solo guitar piece) tend to be relatively effector dependent.

In summary, complex improvisational behaviour is largely pre-programmed. This aligns with the notion that effector dependency of motor skills increases with practice. However these motor programs retain some degree of adaptability aligning with the notion of a generalised motor program. Improvised behaviour that is predominantly guided by procedures results in less sophisticated-though not necessarily less desirable-outcomes. Based on these conclusions it might seem that what is necessary for skilled improvisation is an assembly of pre-programmed, yet somewhat flexible patterns and strategies for their deployment and concatenation. However this is not sufficient. Skilled improvisers must have an enriched knowledge base and be familiar with material from various perspectives. To use Pressing's (1987) terms, they must build up *redundancy* in their cognitive processing structures (pp. 23-24)

2.2.1.2 Redundancy of Cognitive Processing Structures

The fundamental nature of improvisational behaviour is defined by Pressing (1987) as a stringing together of discrete components, which is continued or interrupted by some stream of musical development (p.29). He divides the 'cognitive processing structures' of improvisation into three aspects: acoustic, musical and movement. In other words a musical event can be conceived of in terms of acoustic properties, musical properties and movement properties. The performer can trigger events by initiating one or more of these aspects. For example, a melodic motive can be conceived of as a sound, a series of intervals, or a physical pattern. The more aspects associated with an event, the greater the cognitive redundancy. Pressing articulates this in less technical terms in a later (1998) paper:

> The distinguished expert has materials that are known in intimate detail, and from differing perspectives, and the various materials or modules are cross-linked by connections at various levels of the hierarchical knowledge structure. (1998, p.53)

Therefore a significant difference between the novice and expert is the degree of redundancy or 'connections at various levels of the hierarchical knowledge structure'. It seems that access to relevant knowledge via multiple pathways is a key component in expertise (Chase and Simon 1973, Pressing 1998). Pressing suggests further redundancy at the level of 'analytical representation'- a term used for how each musical motive is represented in the mind of the improviser. For example, a musical motive can be encoded as an *object* (e.g. a Cmaj9 chord), a *feature* (e.g. diatonic, rhythmic regularity) and a *process* (e.g. arpeggiated chord with triplet feel). The motive may be initiated by any one or more of these dimensions but the more "redundancy of description and generation" available the more flexibility and control the performer has (Pressing, 1987, p.24). In other words, with extensive redundancy of various aspects the improviser will always have some means of cognitive organization available regardless of creative intention or attentional load (pp. 23-24). From this perspective, the development of improvisational skill consists, not only in assembling a library of patterns and strategies for deployment, but also the storage of patterns in multiple aspects (acoustic, musical and movement) and the buildup of extensive redundancy by forming strong associative relationships between them.

2.2.1.3 Cognitive Constraints on Improvisational Fluency

Improvisation as defined in this thesis uses various constraints that enable freedom. Some of these are psychological and some are environmental.[11] The focus herein is on the psychological dimension. Creativity is often considered to consist of two stages: a generative stage and an evaluative stage (Sawyer 1992; Johnson-Laird 2002). Analogies between creativity and Darwinian evolution are common (e.g. Csikszentmihalyi 1997) however Johnson-Laird (2002) asserts that improvisation at the level of psychology is more akin to a 'neo-Lamarckian' process. Instead of random mutation at the generative stage followed by critical selection, it involves pre-established criteria for generation followed by random selection. Much of the ideas generated therefore are pre-programmed thus enabling cognitive demands to be divided between working memory and long-term memory (Johnson-Laird, 2002, p.432). A third, somewhat more realistic alternative proposed is that the improviser uses *some* criteria for generation and *some* criteria for selection.

The generative stage of the neo-Lamarckian theory of creativity is consistent with Pressing's (1998) conception of the *referent*, defined as "a set of cognitive, perceptual, or emotional structures (constraints) that guide and aid in the production of musical materials" (p.52). The referent enables the improviser in a number of ways, most significantly by freeing cognitive processing power usually allocated to generation of material, enabling a performer to attend to higher-order processes such as emotional engagement. According to Pressing, the more intimately familiar one is with the referent - i.e. the more redundancy that is accumulated - the more processing power is freed up.

Two additional tools are explored by Pressing which aid improvisational fluency. These are termed *specialist memory* and *the knowledge base.* Specialist memory refers to domain-specific memory in which experts retain vast quantities of information using various techniques including "chunking" which encode meaning into groups of seemingly random information units. One well-known example of this is the 1973 study by Chase and Simon who found that chess masters recalled chess positions with vastly greater accuracy and speed than novices, but *only when the positions corresponded to plausible playing positons* (p.54).

---

[11] For more information see Csikszentmihalyi (1997): *Musical Improvisation: A Systems Approach*

Finally, the knowledge base is the development and application of specialist memory into a series of devices. If specialist memory is domain-specific memory and structuring of ideas, the knowledge base is the development of this into usable techniques, the application of these techniques in various musical situations, and the build-up of cognitive redundancy in the relationships between each of these categories.

2.2.1.4 Learning and Memory Systems

Johnson-Laird (2002) asserted that the use of pre-programmed ideas - a referent in Pressing's (1998) terms - divided cognitive demands between working memory and long-term memory. Working memory refers to a short-term store in which there is limited capacity and "fragility of storage" (Eysenck & Keane, 2005, p.191), e.g. recalling a phone number one has just heard. The capacity for short term recall is around seven units (+/- two) (p.191). In a study carried out by Ericsson (2016), a subject began with a capacity for memorising around eight or nine digits (consistent with working memory capacity). After two-hundred sessions of practice he increased this to recall of eighty-two digits (Ericsson and Pool, 2016, p.5). This was achieved, not by increasing working memory capacity, but by using mnemonics that distributed the load across short-term *and* long-term memory-similar to the way an improviser distributes the cognitive demands of improvisation by employing a referent. Working memory in an improvisatory context refers to real-time conscious choices, error correction, problem-solving etc. Long-term memory refers to the stores of pre-programmed devices, knowledge and strategies-in Pressing's terms: the referent, specialist knowledge and knowledge base.

The limited capacity of working memory means that practice has limited efficacy on working memory itself. Therefore development of skills corresponds to long-term memory.

Chase and Simon (1973) demonstrate this in the example presented earlier: chess masters recalled chess positions with vastly greater accuracy and speed than novices, but only when the positions corresponded to plausible playing positons. In other words, the chess pieces on the board corresponded to known strategies stored in long-term memory. Therefore chess masters demonstrated no superiority in working memory, only in domain-specific long-term memory. Thus in terms of memory, the long-term system appears to be most integral to acquisition of expertise in any domain.

The long-term system is divided into two general categories: declarative memory and procedural memory. Declarative memory is associated with explicitness and increased brain activation (Eysenck & Keane p.232) in that it involves "conscious recollection of previous experiences" (Graf and Schacter, 1985, p.501 in Eysenck & Keane, 2005, p.230). Procedural memory is associated with implicitness and refers to the learning of motor and cognitive skills (Schacter et al. 2000, p.636 in Eysenck & Keane, 2005, p.240) as well as the notion of muscle memory (Berkowitz, 2010, p.9). Improvisational skill is acquired through both declarative and procedural processes as Berkowitz notes;

> Learning to Improvise also appears to include both entirely intuitive and explicitly instructed processes. If one is learning from a treatise or a teacher, like learning a foreign language from a textbook and/or in a classroom, some elements are presented as entities, and some rules and examples of their utility are given (Berkowitz, 2010, p.117)

Declarative processes include the learning of facts (i.e. music theory learning, acknowledgement of idiomatic constraints, analysis of the stylistic tendencies of particular artists etc.) and can be learned via verbal instruction or by analysis of scores and audio. Procedural processes include the transfer of tacit knowledge through practice - i.e. practicing 'model' improvisations, or procedures.

One of the most striking aspects of an improvised performance is the apparent automaticity with which a performer executes their music. This phenomenon is explained by Anderson's 'Adaptive Control of Thought' (ACT) theory (cited in Eysenck & Keane 2005, pp.455-459) in what is termed *knowledge compilation* involving a "progressive shift from the use of declarative knowledge to that of procedural knowledge, and an increase in automaticity" (p.456). This is a two-part process involving *proceduralisation* and *composition.* Proceduralisation requires the "creation of specific production rules [...]" which "reduce or eliminate the necessity to search through long-term memory during skilled performance." Composition involves "reducing a repeated sequence of actions to a more efficient single sequence" (p.456). Knowledge compilation (proceduralisation plus composition) is a critical component in improvisational skill acquisition as Pressing highlights, "[p]art of the effect of improvisational practice is to make motorically transparent by overlearning what has been conceptually mastered" (Pressing, 1998, p.53). Specific techniques for knowledge compilation are outlined by Berkowitz (2010) in the next section.

2.2.1.5 Cognition and Pedagogy

Berkowitz (2010) proves most insightful in terms of the analysis and potential domain-general application of pedagogy. Though his focus is on classical improvisation – analysing treatises on keyboard improvisation of the late 18th early 19th century (e.g. Czerny, 1983/1836) – he relates his findings cross-culturally to Hindustani music (p.42) South Slavic epic poetry, jazz and Javanese gamelan (p.50). More importantly he employs a multi-methodological approach, relating findings to literature on cognitive psychology and carrying out original neurobiological research. Further comparisons are made between improvisation and the field of linguistics. Therefore, 'The Improvising Mind' may be the most applicable domain-general text for understanding and acquiring improvisational skill.

Berkowitz distils roughly five categories of improvisational skill acquisition. The first is rote learning of 'formulas'. Formulas are archetypal patterns of a given musical style, "equally useful for possible insertion into an improvisation and for transmission of fundamental aspects of the musical language in a distilled or simplified fashion" (p.28). Generally speaking they are examples of fundamental harmonic progressions (cadences etc.) and ways to realise them (arpeggios etc.). In other words they are short examples of the framework and stylistic tendencies of an idiom. Formulas function as explicit examples for practical use and for the implicit transmission of underlying principles. They correlate to the pre-programmed patterns outlined earlier that make up the bulk of improvisational behaviour (e.g. Norgaard 2014). Interestingly though, they are given fairly minimal treatment in Berkowitz's study with an emphasis on strategies for their enrichment (accumulation of redundancy) and concatenation. For Berkowitz, the accumulation of useable devices is only the first of five learning strategies. The next four categories are transposition, variation, recombination principles and "models and the acquisition of style" all of which Berkowitz strongly associates with Pressing's notion of enrichment (Berkowitz, 2010, p.39).

Firstly, formulas must be transposed into various keys. This has obvious practical implications in that devices are readily available in various harmonic contexts. Such practice will further facilitate *knowledge compilation* (the proceduralisation and composition of each device). Through continued practice the underlying framework of the formula will become abstracted (i.e. a *schema* will develop) thus internalising it further and building cognitive redundancy.

Secondly, formulas must be practiced with multiple variations. Again this serves a dual function of providing note-for-note deployable devices and the implicit transfer of underlying framework. The more variations on a given formula, the better the outcome, practically speaking. Indeed this aligns with Schmidt's (1975) schema theory in that the strength of the schema is directly correlated to the amount of specific movement variations executed. It also addresses the storage problem posed by Schmidt in that individuals have limited capacity for the storage of movement patterns. Instead of storing motor programs for each movement, *generalised* motor programs for a given class of movement are stored which are parametrically tuneable. In Berkowitz's terms 'only a limited vocabulary of underlying patterns appear to be necessary, though the variations upon them allow for a proliferation of possibilities' (Berkowitz, 2010, p.51).

At this point the student has a developing vocabulary but cannot yet improvise. For that requires knowledge and experience of forming larger grammatical structures or 'recombination principles.' According to Berkowitz these principles are often presented in various forms from short progressions, to arpeggiated flourishes to preludes of up to 20 measures in length (p.56). Importantly, each prelude is composed of "modular components which can be mixed and matched" which reinforce "interconnections between the different motives" (p.57). Once more, the developing improviser learns explicit (combinatorial) rules, implicit (combinatorial) principles and builds redundancy by forming "links between the individual elements of his/her knowledge base" (p.68).

Finally Berkowitz advocates the practicing of improvisational models. These are exemplars of typical improvisations, or allied compositions initially learned note-for-note. Models help transfer implicit knowledge from pedagogue to student in ways that cannot be transferred though prose (p.74). Quoting Pressing (1984) Berkowitz suggests that before learning to improvise, one must be familiar with a large corpus of compositions in the style they wish to improvise in. The "devices used for development of ideas or seeds [...] are in general very similar to those of the allied compositional practices" (Pressing, 1984 p.350). In other words, improvisational devices are inferred through imitative learning processes.

Many implications for the methodological framework of the research herein are explored above. Namely the rote learning of stylistically appropriate formulas and strategies for their deployment, concatenation and enrichment. Formulas should be transposed and presented with as many variations as possible. In doing this they should be practiced to the point of automaticity. Then combinatorial possibilities should be explored of varying lengths. Small example combinations should be nested inside large example combinations. Thus large examples should allow for mixing and matching of ‘modular components’. Finally, full improvisations or sections thereof should be learned in order to absorb implicit procedures, devices and principles that do not lend themselves to explicit analysis – though such analysis may be carried out in addition to the motor skill learning to build cognitive redundancy and enrich the knowledge base.

It would seem that, when possible, this process should occur in iteration. Formulas can be extracted from models and fed back into the input.

2.2.1.6 A Note on ‘How to’ Books in Jazz

The issue with much of the jazz pedagogical literature has been outlined earlier: domain-specificity and a focus on linear improvisation. For example, Andrew York’s *The Classical Guitarist’s Guide to Jazz* (2011) is split into three sections: harmony, chord/melody, improvisation. The first two sections outline multi-voice/polyphonic approaches to playing jazz while the last section – improvisation – explores “single-line improvisation over jazz-style harmony” (p.131). Therefore it is not amalgamation of classical styles and approaches to jazz improvisation, but rather a basic overview of standard jazz improvisation. Barry Greene’s *Advanced Jazz Guitar Improvisation* (2004) is a series of techniques for applying linear melodic devices over particular harmonic contexts. It contains many examples of mnemonics – e.g. diminished scale as two conjoined minor scales (p.18) – and colourful superimpositions of known scalar patterns – e.g. major pentatonic played a tri-tone above the root of a dominant chord produces all altered extensions (p.8).

Similarly Hal Crook’s *Ready, Aim, Improvise* (1999) focuses on linear improvisations over typical jazz harmonic contexts though somewhat more extensively than the previous two. Crook includes directives for improvisation practice, beginning with listing all the musical areas in which one wants to improve e.g. instrumental technique, sight reading, etc. Improvisational content is divided into various categories: melody, rhythm, execution, instrumental technique and "other areas to consider" (p.279-280). Each is further divided into subsections. Melody for example is unpacked into 'melodic functions', 'melodic lyricism', 'melodic curve', 'melodic phrase lengths', 'melodic styles' and 'melodic continuity'. Crook asserts that daily practice should be "a relatively organised event in which you are mainly conscious of your successes; in which you balance working on individual topics and settings with playing for the fun of it." (p.265).

Each of these texts is no doubt useful to any improvising individual, but they have limitations for instrumentalists working outside the domain of jazz. Most deal with jazz vocabularies (some of which will be employed in this research) but little deals with the process of improvisation itself. Crook's may prove the most useful in this context if only for the inclusion of systematic practice planning.

2.2.1.7 Summary of Implications for Practice

The practical implications of each theory/method outlined above tend to converge in a number of ways. For example schema theory suggests that in order to instantiate a parametrically tuneable GMP a general pattern or movement class should be practiced without variation. Variable practice should commence once the stable structure has been established. This is consistent with Berkowitz's notion of leaning 'formulas' which are in turn presented with variations. An additional three strategies are suggested by Berkowitz (transposition, recombination, model learning) which, in addition to variation, enable proceduralisation, enrichment of the knowledge base (Pressing 1998) and the accumulation of cognitive redundancy (Pressing 1988). The knowledge base (along with a 'referent') allows the performer to divide cognitive load between working and long-term memory and attend to higher-order processes in performance such as emotional engagement

2.2.2 Section 2: Flow and Music Practice

2.2.2.1 Overview of Flow

The concept of flow, pioneered by Csikszentmihalyi (1975), has been a subject of interest in the arts, with various studies addressing the relationship between flow and; creativity (e.g. Csikszentmihalyi 1988/2014, Cseh 2016); intuition (e.g. Järvilehto, 2016); and jazz performance (e.g. Hytönen-Ng, 2016). Flow is defined as an optimal experience which occurs when challenges and skills are both high and in balance. During flow, the contents of consciousness are unusually well-ordered and attention is effortlessly and exclusively focused on the task at hand (Csikszentmihalyi, 2002). Flow activities are most often constrained in some way in that they are goal-directed and rule-bound (p.49) with common examples of flow-inducing activities being rock-climbing and chess.

Flow is of particular interest to the present study with regards to its utility in practice. Csikszentmihalyi argues that flow activities '[push] the person to higher levels of performance and [lead] to previously undreamed-of states of consciousness" (2002, p.74) while Butković, Ullén and Mosing (2014) demonstrated a positive correlation between musical flow proneness and hours of practice (p.137).

2.2.2.2 Parallel Theories and Precursors

The notion of flow converges significantly with other notions in psychology and philosophy. For example, Vygotsky (1978) developed the idea of the *zone of proximal development* (ZPD) defined as the space between a child's independent capacity for problem-solving, and their potential capacity when aided by an adult. (John-Steiner & Mann, 1996, p.196). In other words, the child is right on the boundary between their current skills and their potential. Extended to adults the ZPD exhibits the same properties as the flow channel, defined as a balance between high challenges and high skills. Flow can thus be regarded as the phenomenological dimension of the

ZPD. Similarly Maslow's (1962) idea of *peak experiences* seems to be an early influence on the development of flow theory:

> [Peak experiences] were of pure, positive happiness when all doubts, all fears, all inhibitions, all tensions, all weaknesses, were left behind. Now self consciousness was lost. All separateness and distance from the world disappeared as they felt one with the world, fused with it, really belonging in it and to it, instead of being outside looking in. (p.9)

The peak experience, however, was associated more with religious and mystical experience than with skilled cognitive/motor tasks. For instance Maslow acknowledges that his findings seem to conform with Zen and Tao philosophies (p.13) suggesting that peak experiences reveal "the nature of Being itself" where "eternal values" become immediate realities (p.18). Indeed, for the Taoists the universe is thought to be composed of *yang* and *yin;* chaos and order; the unknown and the known; with Tao being the pattern of behaviour that mediates between them (Peterson, 1999, p.87). The flow channel can thus be viewed as an indicator of the balanced mediation between the unknown/chaos (or *challenge*) and the known/order (or *skills*). Finally, the idea of *flowing* appears throughout Taoist literature, for example, the principle of non-action or *Wu-wei* is often described as "flowing with the moment" (Watts, 1975, p.96). Considering the commonalities among Western psychological theories and ancient Eastern philosophy it would seem that notions of flow, the zone of proximal development, peak experiences and those associated with Taoism and Zen are not mere epiphenomena but point towards something more fundamental, as alluded to by Maslow (1962, p.18).

2.2.2.3 The Nine Dimensions of Flow: Preconditions and Experiences

Csikszentmihalyi (2002) outlines nine dimensions of flow. These have been used in other studies to construct measurement tools such as the Dispositional Flow Scale-2 (short) which presents nine items, each reflecting a flow dimension (e.g. Martin, Jackson, Eklund, 2008, Araüjo & Hein, 2016). Because of the emphasis on the utility of flow in the present study, these dimensions have been categorised into *preconditions* (task-related and cognitive-related) and *experiences* (for a similar categorisation see: Järvilehto, 2016, p.100). Preconditions are flow dimensions which are entirely, or partially under an individual's direct control. Experiences are phenomena that arise as a result of flow, and therefore individuals have little or no direct control.

- Task preconditions: (1) *challenge-skill balance*, (2) *clear goals*, (3) *proximal feedback*.
- Cognitive preconditions: (4) *concentration on the task at hand.*
- Experiences: (5) *action-awareness merging,* (6*) a sense of self-efficacy,* (7) *loss of self-consciousness,* (8) *time distortion,* (9) *autotelic experience.*

One term which may need unpacking is *autotelic experience* (from the Greek roots *auto* and *telos* meaning *self* and *goal* respectively) which literally means the experience of a self-contained goal. An activity that is autotelic is an end in itself and is not done for some future reward or benefit. (Csikszentmihalyi, 2002, p.67). Csikszentmihalyi has extended this to a set of personality traits he calls the *autotelic personality.* Intrapsychic factors may impede or facilitate flow depending on a person's temperament and their mental health. People with an autotelic personality are unselfconscious, un-self-centred and are able to focus their attention effectively (p.85-86).

It is important to note that there is some theoretical conflict in flow research, some of which pertains to the nine dimensions. For example, Heutte et al. (2016) outline some issues surrounding common research methods (e.g. ESM, FKS, WOLF) and suggest that each of the nine flow components vary in salience across contexts, for example, physically demanding flow experiences may be less cognitively salient (p.129-130). Similarly Cseh (2016) reviews potential theoretical conflict in flow and creativity research. There has been some debate as to the nine indicators of flow experience, particularly *clear goals* and *unambiguous feedback*, and their relationship with creativity, as creative tasks involve much more ambiguity than automatable tasks. Csikszentmihalyi addresses these issues claiming that artists internalise "the field's criteria of judgement" (Csikszentmihalyi, 2002, p.116) and use this to direct their actions and provide feedback. However Cseh suggests that *clear goals* and *unambiguous feedback* may in fact be undesirable components to both creativity and flow noting that tolerance to ambiguity is a common trait in creative individuals (Cseh, 2016 p.84). One possible point of reconciliation is that an individual may use clear goals and unambiguous feedback as preconditions for flow induction, and later dispense with them to some degree. This would be similar to the stages of meditation in relation to effortful attention outlined by Posner et al. (2010) discussed later.

2.2.2.4 Attention and Effortlessness

A major indicator of flow experience is the feeling of effortlessness when engaged in a challenging task. However, Bruya (2010) notes that a challenging task requires effort and that, in general, the greater the demands of a particular action, "the greater the effort required to sustain a level of efficacy" (p.1). This is clearly not the case for flow however, in which perceived effort decreases while the level of efficacy is sustained or even increased. Effortlessness herein, is defined as attention or action which requires physical or mental exertion, however "subjective effort is lower than in normal conditions, with effectiveness maintained at a normal or elevated level." (p.5). Expert performers seem to both exhibit and experience a sense of effortlessness when engaged in highly skilled performance. Indeed, *effortful* action appears to deplete mental resources and cause a temporary reduction in self-control (Schmeichel & Baumeister, 2010). Therefore, those engaged in *effortless* action can maintain a high level of efficacy for longer periods of time.

This section will address the following questions: what are the underlying mechanisms responsible for reduction in subjective effort during flow? And can this information be used to induce flow or increase the likelihood for flow induction?

One theory for the neurocognitive mechanisms underlying the experience of effortlessness in flow is Dietrich's (2004) theory of *transient hypofrontality*. Dietrich makes the case that reports of effortlessness, loss of self-consciousness and a lack of thinking described by composers, surgeons and chess players must represent a temporary lack of activity in the dorsolateral prefrontal cortex. This region of the brain is responsible for abstract thinking, planning, self-reflection and sustained and directed attention. In terms of the dual processing theories of cognition, these activities are associated with the conscious explicit *system 2* "capable of processing only a small amount of information serially", as opposed to the non-conscious implicit *system 1* which is "capable of massive parallel processing" (Järvilehto, 2016, p.96). Therefore, In Dietrich's view, it is system 1 which dominates during flow and that interference from system 2 may obstruct the flowing of an implicit task. To initiate flow activities however, there is some evidence that an individual may be required to consciously exert effort to focus their attention on the task at hand, later giving way to complete nonconscious involvement. For example, Csikszentmihalyi (1975/2014) suggests that the merging of action and awareness (which in his view, is perhaps the clearest sign of flow experience) is "made possible by a centering of attention on a limited stimulus field" (p.139). This centering of attention has been shown to downregulate brain activity in a specific neuronal network associated with self-consciousness. This is labelled *the default mode network* (DMN) or the *network of self-awareness* (Sadlo, 2016, p.381) which shows higher levels of activity and energy consumption when an individual is *not* focusing on a specific motor/cognitive task (p.379). Indeed, Dietrich concludes that inhibition of the explicit system may be facilitated by volitional control of the explicit system itself:

> […] volitional control over the executive attentional system can be used to narrow the focus of attention to exclusively buffer the task at hand, eliminating other phenomenological features computed by the explicit system to enter consciousness. Put another way, this is a behavioral method that maximizes the implicitness of the skill's execution by flexing the muscle of attention. (Dietrich, 2004, p.758).

Similarly, Posner et al. (2010) suggest three stages of meditation practice, moving progressively from conscious volitional control to effortless implicit control. The initial stage requires strong executive function and can be relatively *effortful.* (p.419). The middle stage still involves some effortful control but works in parallel with the autonomic nervous system[12]. In the later stages, it is suggested, little or no effortful control is needed and one 'totally forgets the body, oneself, and the environment' (p.420). Meditation practice, called Integrative Body-Mind Training (IBMT) carried out for just five days, demonstrated an increase in executive attention and a decrease in negative affect, fatigue and cortisol response to challenges (Posner et al., 2010). If there are indeed parallels between meditation practice and flow, it may be that flow can be induced with skilled effort in the same way that the final stage of the meditation is induced by the previous stages.

Attention must be centred on the task at hand–consciously or unconsciously–for flow induction to be possible. However, exactly what is the attention directed towards? Wulf & Lewthwaite (2010) have demonstrated that an external focus of attention results in more effective learning and performance than an internal one. An internal focus is defined as attention directed at the performer's body movements. An external focus is defined as attention directed at the effects of the movements on the environment. (p.76). These findings seem to contradict some texts such as *Just Being at the Piano* (Chase, 1974) which includes an entire chapter on directing attention towards the body and towards movement. One point of reconciliation may be that Chase advocates neutrally observing bodily movements, rather than trying consciously control them, and is more akin to the idea of mindfulness–roughly defined as non-judgmental observation, reflecting what is happening in the present moment, exactly the way it is happening, without biases (Gunaratana, 2002, p.139). Indeed in Buddhist literature distinctions are drawn between mindfulness and concentration, the former akin to soft, unfocused peripheral vision (p.138), the latter involving force and willpower (p.149). Wulf and Lewthwaite write that "individuals who try to consciously control their movements (i.e. adopt an internal attentional focus) tend to constrain their motor system and interfere with automatic control processes." (Wulf & Lewthwaite, 2010, p.76). Therefore it is the attempt to *consciously control* bodily movements, not necessarily the attention directed at them, that disrupts learning and performance. There appears to be no literature studying the efficacy of mindful internal attentional focus vs. external attentional focus.

---

[12] A largely unconscious, involuntary system regulating certain bodily functions such as heart rate, breathing etc.

In summary, to achieve flow individuals may exert volitional control of the explicit system, even though flow is characterised by dominance of the implicit system. The explicit centring of attention functions to block out interference from other stimuli that may impede flow induction. Similar to the stages of meditation outlined above, the conscious control of attention in the initial stages of a flow activity may recede in the later stages, giving way to a deeper flow experience. Attention should be directed either externally (to the effects of one's actions in the environment) or inwardly, but in a neutral, passive or 'mindful' fashion.

2.2.2.5 Flow and Music Practice

Araüjo and Hein (2016) suggest that some aspects of music practice may not be conducive to flow as it is a solitary, effortful activity focused on a musician's deficiencies (p.25). They acknowledge that musicians who demonstrate high levels of expertise often have deliberate strategies which make practice as efficient and effective as possible. This is facilitated by what is termed *self-regulated practice behaviours* which involve management, planning and metacognitive engagement with practice approaches, 'choosing, modifying and adapting practice strategies' (p.25). The authors suggest that some of these self-regulated practice behaviours may be associated with, or conducive to flow, noting that Bukovic et al. (2015) found a positive correlation between flow proneness and total hours of lifetime practice. In other words, expert musicians may be more flow-prone than non-expert musicians, and this may be a result of their self-regulating behaviours during practice. Indeed there are various accounts of musicians describing what is essentially flow during practice:

> It is impossible to be self-conscious and totally involved in the music at the same time. Consciousness of the self is a barrier between the player and the instrument. As I forget my own presence, I attain a state of oneness with the activity and become absorbed in a way that defies the passage of time. (Chase, 1974, p.1)

Flow dimensions indicated*: loss of self-consciousness, action-awareness merging, time distortion.*

> There is no fear, because he is not attached to the results of actions. Practice takes no patience, since there is no burning need to reach a goal. There is simply the celebration of the doing, the learning, the achieving and the enjoying. (Werner, 1996, p.78)

Flow dimensions indicated*: autotelic experience.*

> Out of the fullness of this presence of mind, disturbed by no ulterior motive, the artist who is released from all attachment must practise his art. (Herrigel, 1953, p.55)

Flow dimensions indicated: *concentration on the task at hand, autotelic experience.*

> By the end of the first hour [of aikido practice], however, I had settled into a steady trancelike rhythm that obliterated all considerations of time or repetition. My perceptions

> expanded. The barely noticeable variations from one throw to the next became significant and revealing. (Leonard, 1992, p.76)

Flow dimensions indicated: *concentration on the task at hand, time distortion.*

The implication of the above statements is that at least some phases of practice are conducive to at least some dimensions of flow. However, none of the task preconditions (*challenge-skill balance, clear goals,* and *proximal feedback*) are indicated in any of the above statements. In fact the dimension *clear goals* appears to be contradictory to two statements above (Herrigel and Werner).

On the other hand, Araüjo and Hein (2016) found that particular self-regulated practice strategies of classical musicians were positively correlated to flow dimensions; *challenge-skill balance, clear goals, proximal feedback, concentration on the task at hand* and *a sense of self-efficacy.* These include *all* of the task preconditions of flow. Indeed, there are some contradictions in the literature. Consider the following statement from Ericsson (1993) who pioneered the concept of deliberate practice:

> In contrast to play, deliberate practice is a highly structured activity, the explicit goal of which is to improve performance. Specific tasks are invented to overcome weaknesses, and performance is carefully monitored to provide cues for ways to improve it further. We claim that deliberate practice requires effort and is not inherently enjoyable. Individuals are motivated to practice because practice improves performance. (p.368)

Importantly, the last sentence is a direct contradiction of flow dimension *autotelic experience*. One explanation for the incongruence between the statement from Ericsson, and those from Chase, Werner, Herrigel and Leonard is that they are describing a different *phase* of practice. Similar to the phases of meditation outlined earlier, flow induction in music practice may be a two- or three-phase process. The strict self-regulatory practice of classical musicians indicates an effective early-phase practice strategy for facilitating flow dimensions: *challenge-skill balance, clear goals, proximal feedback* and *concentration on the task at hand.* However later-phase practice may involve letting go of specific practice strategies (e.g. having a definite plan) to attain the remaining flow dimensions; *action-awareness merging, loss of self-consciousness, time distortion* and *autotelic experience*, and thus "[*push] the person to higher levels of performance" leading to "previously undreamed-of states of consciousness"* (Csikszenkmihalyi, 2002, p.74).

2.2.2.6 Summary

The flow state is thought to engage the implicit cognitive system, however, there is some evidence that this state may be induced by volitional control of the explicit system. Therefore an individual may have some degree of control in flow induction by focusing attentional resources. Furthermore, there is apparent tension between Ericsson's notion of deliberate/purposeful practice and that of flow. Indeed to Ericsson himself, they are irreconcilable concepts. However, in the methodology chapter later in this thesis a reconciliation is proposed that divides practice into two phases termed *teleological* and *autotelic* practice.

3 OVERVIEW OF KEY INFLUENCES

This section explores the techniques, devices and stylistic traits of two guitarists who have been influential in my playing. Thomas Leeb was selected for being a major influence on my early work, having studied with him personally and often being compared to him stylistically. I analyse the various techniques and devices which have been influential and subsequently demonstrate them in action in one of my own compositions.

The second guitarist selected was Ralph Towner. He has been a more recent influence in my playing and is known for bridging the gap between composed and improvised music – a key concept in this thesis. Also of interest is his use of guitar-specific harmony in what has been termed *new-age harmony*.

Together, these two guitarists model the trajectory of this thesis: to take the vocabulary of contemporary fingerstyle guitar (Leeb) and develop it through improvisational approaches (Towner).

3.1 THOMAS LEEB: ANALYSIS OF TECHNIQUES AND COMPOSITIONAL DEVICES

The following section explores the stylistic traits of Thomas Leeb, paying particular attention to those elements which have influenced my own practice. Although many other contemporary fingerstyle guitarists have been integral to my development (notably, Pierre Bensusan and Michael Hedges), Leeb was identified as being the most significant and demonstrable influence.

Multiple analytical methods are used but primacy is given to technical analysis – that is, analysis of the physical techniques involved, as these have been most influential. Other methods include traditional forms of analysis focusing on harmonic, melodic and/or rhythmic content; and phenomenological analysis interpreting the music as experience; colour, quality, affect etc. (Cook, 1987). Each method is a tool for illuminating aspects of Leeb's work that have had a major influence on my own practice. These aspects have been categorised as (1) guitar techniques, (2) arranging techniques and (3) compositional devices. With the exception of the Mark Grover transcriptions (*Fishbowl* and *Slipstream*), each transcription is intended to highlight a particular aspect, and therefore may emphasise or neglect certain features.

3.1.1 Guitar Techniques: Percussion and Hand Independence in Albino

Leeb is well known for his use of percussion as a featured musical device rather than mere accompaniment. Notable examples of this include *Desert Pirate* (2007), *Grooveyard* (2007) and *Albino* (2006). Often each hand has distinct function with the left assuming pitch content and the right assuming percussion. The most salient example of this is the introductory material in *Albino*.

Tuning: CGDGBbD

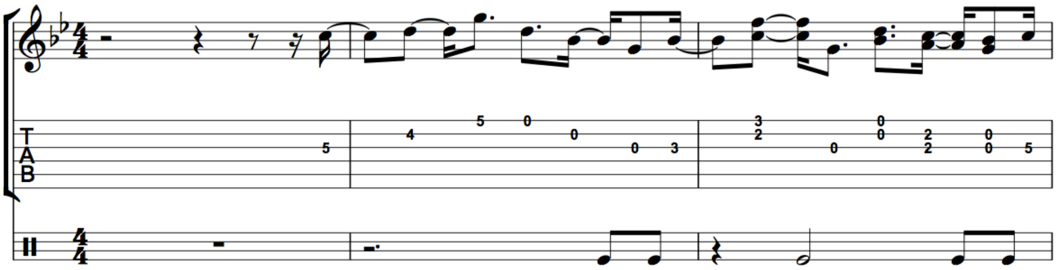


Figure 3.1 Albino

Audio (B) 3.1 Albino (0:00-0:05)

The left hand assumes a melodic motif comprised of a series of arpeggios outlining a harmonic structure, approximately Csus2 (ii), Gmin (vi), Bbsus2 (I), Gmin (vi). Initiating with a sus2 chord lacks the grounding and assertiveness of a major/minor triad with tonic function and gives the piece a sense of ambiguity. This ambiguity is reinforced by the syncopated rhythms – the pulse is only really discernible in the third bar when the percussion has been introduced.

Each event in the tablature stave is either a 'hammer-on' or 'pull-off' which results in a sharp, percussive attack. The right hand assumes percussive 'thuds' on the lower bout of the guitar contributing a sense of pulse. So far each part weaves around the other; however once the main percussive motif begins (fig. 3.2) there are several points of convergence.

Tuning: CGDGBbD

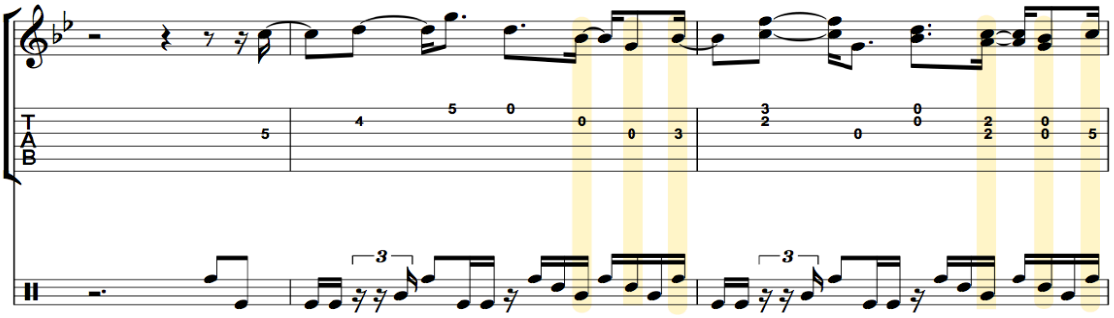


Figure 3.2 Albino ex. 2

Audio (B) 3.2 Albino (0:20-0:25)

Key for bottom stave:

1st line (bottom): heel of hand strikes lower bout

2nd line: side of thumb strikes lower bout

3rd line: index finger strikes side (below lower bout)

4th line: middle finger strikes side (below lower bout)

The percussive content comprises four strikes indicated in the key above. The specificity of digits/guitar body placement is important for two reasons. One is dexterity. Striking with three digits and the heel of the hand allows for a rolling motion, enabling quick execution of successive events. The second is timbre. A heel strike (line 1) produces a low bass thud; a thumb strike (2) produces a mid-frequency thud, and finger strikes on the side (3, 4) produce brighter attacks. The brightness of attack depend on the area of the guitar body that is struck. For example, a finger strike towards the convex portion of the side will sound brighter, and towards the concave portion (waist) will sound darker. Thus index- and middle-finger strikes will have slightly different timbres.

For the most part, each hand weaves around one another, bouncing back and forth. However, there are three points of convergence towards the end of each bar. This makes for a more cognitively demanding execution than if no points of convergence were present. Rather than a linear succession of singular events, it requires the performer to occasionally execute simultaneous separate functions for each hand. Therefore it is likely that it is encoded as a single interdependent motor pattern, rather than as two simultaneous patterns. In other words each voice may have been conceived separately, but learned and integrated singularly.

3.1.2 Guitar Techniques: Pianistic and Vocalistic Approaches to Functional Harmonics

Another device that is often associated with Leeb is the use of functional harmonics. That is harmonics that serve a melodic or structural purpose rather than ornamentation. The harmonic is executed as a *natural* harmonic or *artificial* harmonic and therefore allows for almost any necessary melodic pitch to be sounded. There are several techniques Leeb uses to achieve functional harmonics, two of which will be explored here.

The first is *cascading* or *harp* harmonics. This involves cascading scalar or arpeggiated sequences partially achieved by harmonics, partially by non-harmonic pitches using an extension of the *campanella* technique. In the example of *Quicksilver* (2007) below, a static chord position is held for each bar. Pitches in green are harmonics, pitches in black are non-harmonics. Bar one comprises a Cm9 chord voiced as *C-Bb-Eb-G-C-D*. However when arpeggiated with harp harmonics the voicing becomes closer and more linear: *C-G-Bb-C-D-Eb*. Similarly, bar two comprises a Ebmaj9#11 chord voiced as *Eb-A-F-G-Bb-D* and when arpeggiated with harp harmonics is sounded as *Eb-G-A-Bb-D-F*. The intended result is a pianistic flourish; a resonant unfolding of the underlying harmony.

Tuning: CGDGBbD

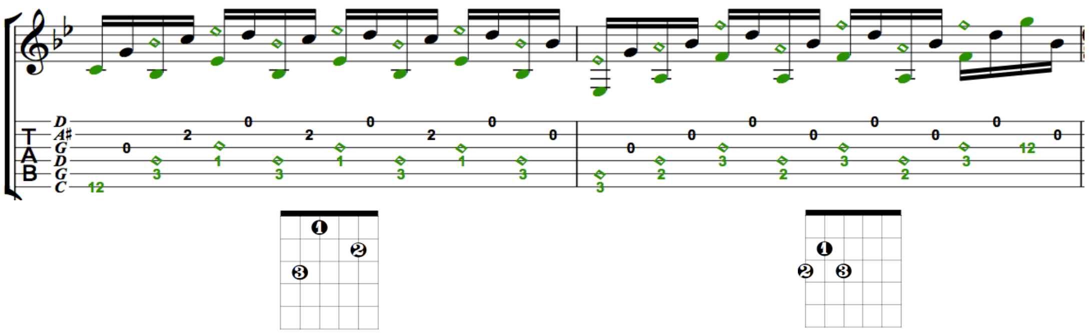


Figure 3.3 Quicksilver

Audio (B) 3.3 Quicksilver (0:15-0:23)

Another common technique used by Leeb - and one that he has pioneered - is the bending and sliding of harmonics. For example, once a fretted harmonic is initiated, it can be bent to alter the pitch while sounding the harmonic partial relative to the bent pitch. It can also be used effectively in sliding from one pitch to another, though with more of the fundamental sounding, resulting in a kind of semi-harmonic. If the previous technique was pianistic in intention, this technique is vocalistic. It aims to recreate the articulation and microtonal nuances of the human voice, adding expressiveness, clarity and textural separation. Below is an excerpt from one of Leeb's most well-known compositions, *Akaskero* (1999), demonstrating both bent harmonics and sliding harmonics. The name is in reference to Akaskero in northern Finland where the aurora borealis can be viewed. The bent harmonic would seem to imitate the howling of wolves.

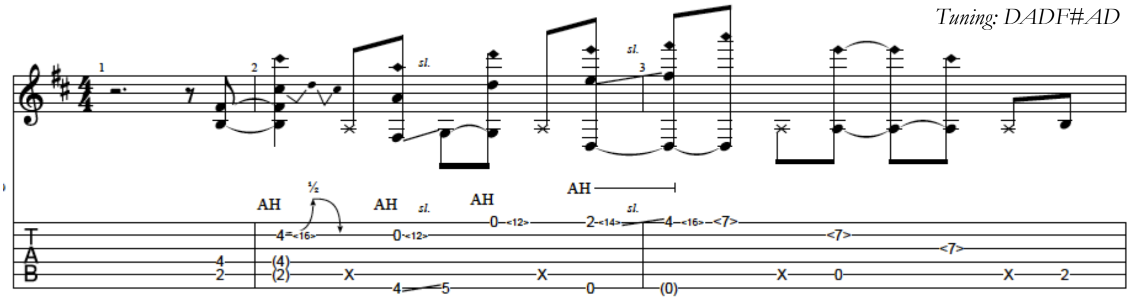

Tuning: DADF#AD

Figure 3.4 Akaskero

Audio (B) 3.4 Akaskero (1:02-1:08)

3.1.3 Arranging Techniques: Implied Polyphony in *No Alibis*

Another defining trait of Leeb's work is a particular arranging style in which multiple voices are alluded to without being explicitly stated. There is an implied polyphony. This is often known as compound melody (Davis, 2006) in which a single melodic line is heard as multiple voices. This can be observed in the unaccompanied string works of J.S. Bach which are mostly monophonic *on paper*, but have an implied sense of polyphony (see Dann, 1968, p.196-197).

Leeb has a similar approach. Not so much in terms of two discrete melodic lines but of multiple voices. Below is an excerpt from Leeb's *No Alibis* (2011) featuring four implied voices.

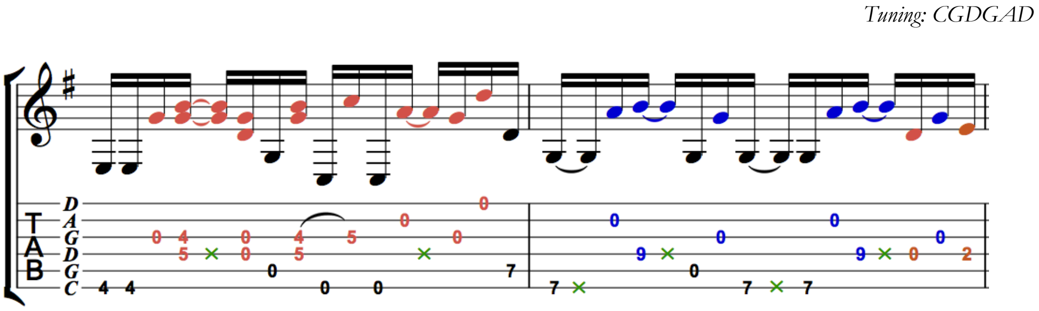


Figure 3.5 Four voices in No Alibis

Audio (B) 3.5 No Alibis (1:49-1:55)

A) *Melodic statement* with occasional harmonisation in 3rds/4ths (red).

B) *Counter motif* threading sections together by linking melodic statements (blue).

C) *Bass-line* serving the triple functions of implied melody, defining the harmonic progression and adding rhythmic density (black).

D) *Percussion* serving the double functions of accentuating the backbeat and adding rhythmic density/textural contrast (green)

Specific parts serving multiple functions is a recurring theme in this example. The percussive strikes not only serve to accentuate the backbeat but also fill in any 16th note gaps. The cumulative voices result in constant 16th note motion which, along with the percussive attack of much of the pitch material, imply a continuous percussive voice throughout.

The bass outlines and defines the harmonic progression, approximately *Em (vi), Em/G (vib), C (IV), Gadd9 (I),* but can also be viewed as having rhythmic function. For example, two bass notes are clustered together in quick succession at the start of bar one above. Clearly the second note is redundant in terms of outlining the harmony and therefore must be rhythmic – and to some degree, textural - in its function. Furthermore, some of the bass notes are perceived as being melodic and can therefore be viewed as part of the melody in octave displacement. Fig. 3.6 is an example of the *implied* melody and counter motif which can be heard but are not strictly played. It begins with the counter motif, entangling with the main melody towards the end of the bar. The melody is stated, the final pitch (D) subsequently being sustained over the counter motif. In actuality, the initial pitch (G) is played down one octave, but is perceived as moving in conjunct motion to the next pitch (A).

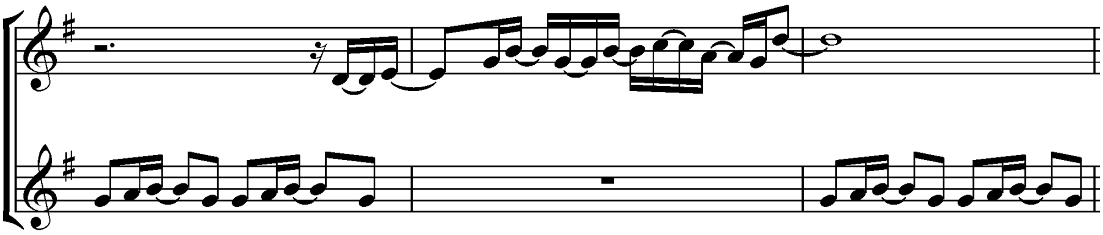


Figure 3.6 Implied melodies in No Alibis

3.1.4 Compositional Devices: Ambiguity and The Single-Note Ostinato

One notable compositional technique used by Leeb is the recurrence of some form of short rhythmic ostinato. This often functions to thread a piece together by linking sections that may otherwise seem disparate. The ostinato may recede and give way to other dominant voices but will re-emerge when textural space is available. In this sense it contributes to the implied polyphony discussed in the section above. Examples of this can be heard in *Desert Pirate* (2007), *Trickster* (2014) and most notably, *Fishbowl* (2012):

Tuning: DADF#AE

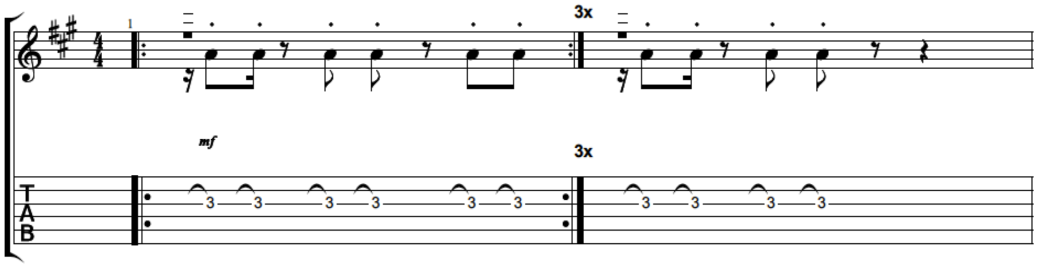


Figure 3.7 Fishbowl (transcription by Grover)

Audio (B) 3.6 Fishbowl (0:03-0:13)

Fishbowl begins with a simple but rhythmically ambiguous single-note ostinato (fig. 3.7). No sense of a pulse is given as beats one and two are completely avoided. Initially this tricks the listener into hearing the first note as occurring on beat one, which is soon disrupted as the cycle repeats. As this initial 'implied pulse' is in such proximity to the actual pulse (being off by one semi-quaver) it is difficult for the listener to re-organise the rhythmic relationships and grasp the pulse. However, as the piece unfolds the pulse becomes more and more obvious.

In fig. 3.8, a series of dyads are weaved around the ostinato using a combination of natural harmonics, artificial harmonics, stopped strings and open strings. The contrast in timbre – one being staccato, the other being sustained and resonant – creates a sense of depth. Beat one of each bar is signified with the placement of a dyad, but the other beats remain relatively ambiguous. Not until percussion is introduced, does the pulse become fully apparent.

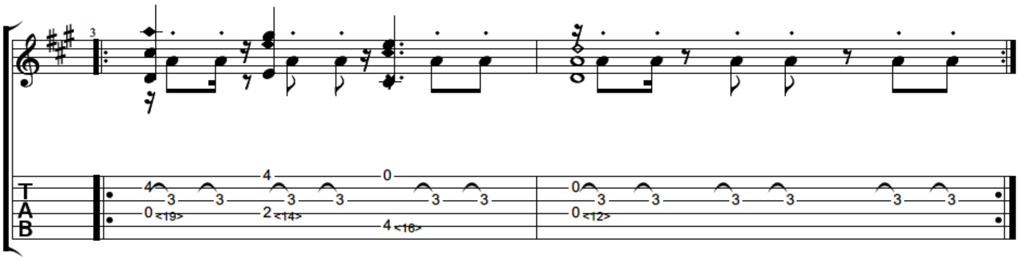


Figure 3.8 Fishbowl ex.2

Audio (B) 3.7 Fishbowl (0:14-0:23)

In fig. 3.9 the pulse is concretely established as every beat features some significant event. Beat one of each bar is initiated with a bass note and beats two and four are accented with percussive strikes. This creates a feeling of satisfaction for the listener; the sense of journey from ambiguity to transparency on the back of a single pitch.

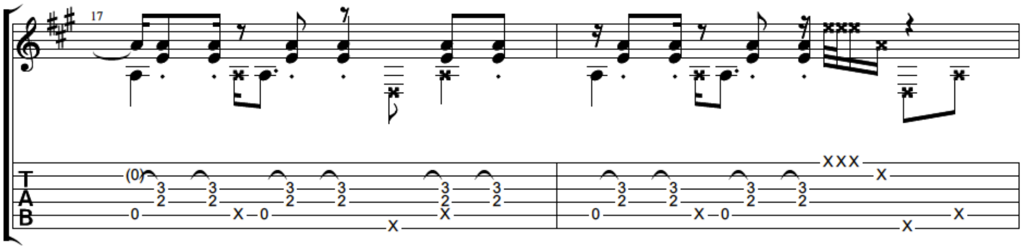


Figure 3.9 Fishbowl ex.3

Audio (B) 3.8 Fishbowl (0:54-0:59)

Transparency is not always the intended goal however. Leeb uses ambiguity in other instances with no real sense of unfolding into transparency, as can be observed in *Upside Down (2006)*:

Tuning: DADGAD

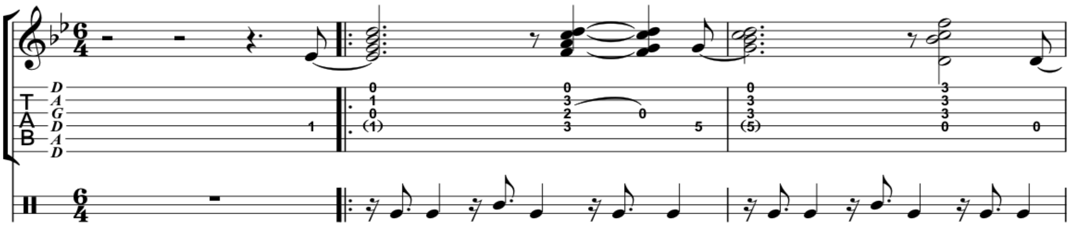


Figure 3.10 Upside Down

Audio (B) 3.9 Upside Down (0:23-0:30)

The rhythmic motif (bottom stave) spans the entire piece and more-or-less remains consistent throughout. Downbeats on one, three and five are all avoided in the percussive stave and only beat one is instantiated in the pitch material above. This remains so, for most of the piece making it one of Leeb's most rhythmically ambiguous. Harmonically it is somewhat ambiguous also. Leeb utilises chord extensions and suspensions in close voicings creating tension and dissonance. The chords in the example above move from *Ebmaj7 (IV) Fmaj6 (V) Gmadd11 (vi) Bbadd9/D (Ib*). Therefore, although the tonality is clear, its transparency is somewhat stifled by the extensions/suspensions in close voicings and the inversion of the I chord.

3.1.5 Slipstream: Leeb's Influence in Personal Practice

The four stylistic traits explored above - (1) right-hand percussive devices, (2) functional harmonics, (3) implied polyphony and (4) the use of a single note ostinato to thread sections together – were selected because of their influence on my own creative practice. Each element has been assimilated through both conscious and unconscious processes; through deliberate practice and through osmosis. One of my compositions from 2015 entitled *Slipstream* demonstrates all of these elements to varying degrees. Slipstream was in part an attempt to reconcile the techniques I had been learning and developing from Leeb with the musical sensibilities of Van Morrison: the title is in reference to Morrison's *Astral Weeks (1968).*

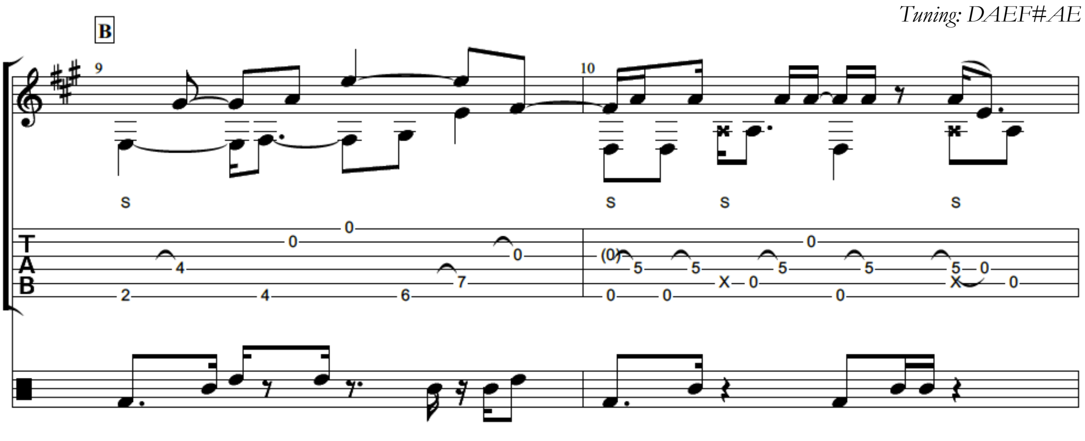


Figure 3.11 Slipstream (transcription by Grover)

Audio (B) 3.10 Slipstream (0:29-0:36)

The right hand has many functions in Slipstream and therefore differs somewhat from Leeb's *Albino*). The right-hand assumes some of the pitch material as it would be impossible or undesirable to play all of it with the percussive attack associated with tapped notes. It begins with a bass thud and simultaneous striking of the first bass note (E). In the first bar of fig. 3.11 convergence occurs at the first and last events of the bar. The material in between is reciprocal, bouncing back and forth between pitch material and percussive events. The following bar features many more instances of convergence between left and right hands. The intended effect is simply tension and resolution. In bar nine of fig. 3.11, beats three and four are avoided in the percussive voice and the offbeat after four is accented. The following bar resolves both harmonically (to D Lydian) and rhythmically, with percussive events on all pulse beats. Furthermore, two distinct melodic lines can be heard against one another as demonstrated in fig. 3.12. The penultimate melodic pitch can also be heard as part of the bass line, moving down to the final D of the bottom line. The D in this case would be perceived one octave higher than what is played.

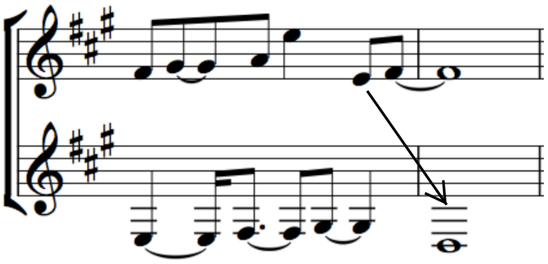


Figure 3.12 Slipstream ex.2

The counter motif in this case, is a single note ostinato similar to Leeb's *Fishbowl.* Like Fishbowl, it consists of a syncopated rhythm which is 'tapped' on by the left hand (fig. 3.13). This has the function of providing rhythmic interest, leaving the on-beats open for bass/percussion.

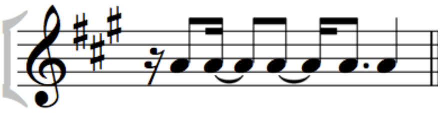


Figure 3.13 Slipstream ex.3

The next example further exemplifies the idea of implied voices. Both the implied melody (fig. 3.14) and the actual pitches (fig. 3.15) are transcribed. Once again the actual voices imply a coherent melodic line by suggesting movement in conjunct motion through a pentatonic line, though some notes are in octave displacement. The lower octave (the notes in displacement) are achieved as tapped notes, while the higher octave notes are achieved with harmonics. Therefore, this is an example of functional harmonics. Similar to Leeb's vocalistic approach in Akaskero, the harmonics are played as the upper voice of a polyphonic line and feature some vocalistic articulations such as sliding from one harmonic to the next.

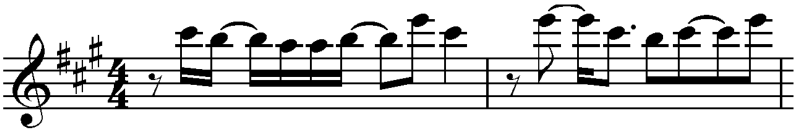


Figure 3.14 Slipstream ex.4

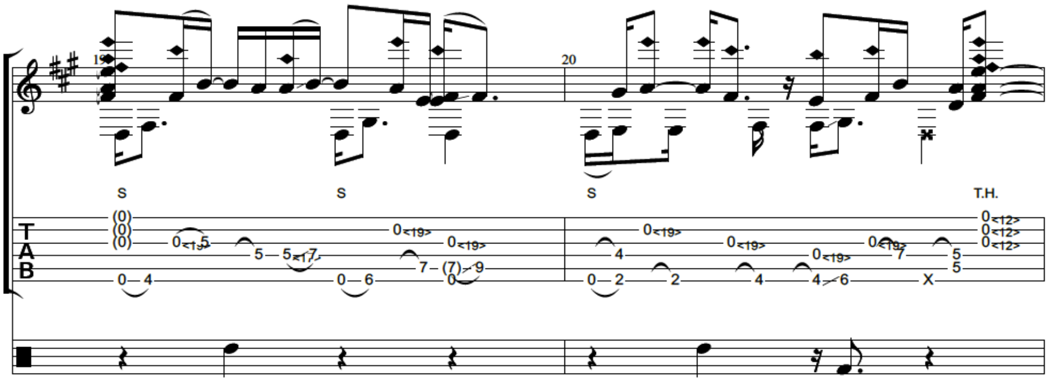


Figure 3.15 Slipstream ex.5

Audio (B) 3.11 Slipstream (1:02-1:09)

In summary, Leeb's work has been influential in three ways. The first was guitar techniques, comprising extensive body percussion and functional harmonics. Functional harmonics were observed in the form of a *pianistic approach*, imitating scalar/arpeggiated runs on the piano, and a *vocalistic approach,* imitating the microtonal nuances and articulations of the human voice. The second was arranging techniques, in particular, his use of implied polyphony, alluding to multiple voices without explicitly stating them. Finally was his use of specific compositional devices, namely, the use of ambiguity and a single-note ostinato to thread sections together. Each of these techniques and devices can be observed to varying degrees in the examples of Slipstream presented above, demonstrating their integration into my own personal creative practice.

Further examples:

Audio (B) 3.12 Desert Pirate (G. Lutton live performance)

Audio (B) 3.13 Albino (G. Lutton live performance)

3.2 RALPH TOWNER: ANALYSIS OF IMPROVISATIONAL APPROACHES AND HARMONIC DEVICES

Ralph Towner is a musician, composer and improviser known for "transcend[ing] the dualities of jazz/classical and composed/improvised music" (Towner, 1985, p.4). He is of particular interest not just for bridging this gap, but also for his use of specific devices which have been influential in my own playing. As a solo guitarist, he integrates meticulously composed sections with improvised passages, exploring various avenues of the harmonic/melodic framework of a given tune in real time. Garcia's (2014) thesis entitled *Stringshift. Solo Guitar Improvisation: Process, Methodology and Practice,* is a notable contribution to the literature on Towner, which draws on Towner's pedagogical methods and his assimilation of classical guitar technique with improvisational concepts outlined in his book *Improvisation and Performance Techniques for Classical and Acoustic Guitar* (Towner, 1985). Some of this will be explored herein, namely Towner's approach to incorporating improvisatory elements into his solo guitar playing. However, this section will also investigate Towner's use of specific harmonic devices: the combination of open and stopped strings to create rich chord voicings (termed *new age harmony*) and the use of common tones to link adventurous harmonic progressions.

3.1.6 The 'Spotlight Panning' Concept

Towner is well-known for incorporating improvisatory elements into his solo guitar performances. His process for doing this involves focusing one part at a time while maintaining a general sense of the whole. There are several useful analogies in his book that help illuminate his process more thoroughly. In a section entitled 'Solo Guitar Playing' he writes:

> In a play, the characters evolve and develop further with the amount of exposure time the author allots to them. To develop several characters simultaneously requires hopping

> from one to another, utilising various compositional devices. This approach can be used in music as well. Your concern is with the individual development of several musical areas or parts while simultaneously keeping an overview of the total proceedings and the overall impact. (Towner, 1985, p.34)

The idea here is to use one's attention as a "spotlight panning from one area of interest to another" (p.37) while maintaining a background awareness of the whole. Indeed this relates to the idea of *compound melody* or *implied polyphony* explored in section on Leeb in which multiple voices are alluded to without being explicitly stated. Towner articulates this concept stating that it is not "aesthetically necessary" to have two or three "equally active parts" but that an effective approach often comprises "focusing on a single part at one time while maintaining the thread of all three". (p.37). By necessity this approach entails a sort of 'musical data compression', in which the number of 'bits' needed to represent certain musical data is reduced. Towner includes a useful depiction of this process in his book in which the dotted lines represent a sustained note and the solid lines represent "full activity" (p.37). Here one can observe the practice of *focusing on one part, while maintaining a sense of the whole.*

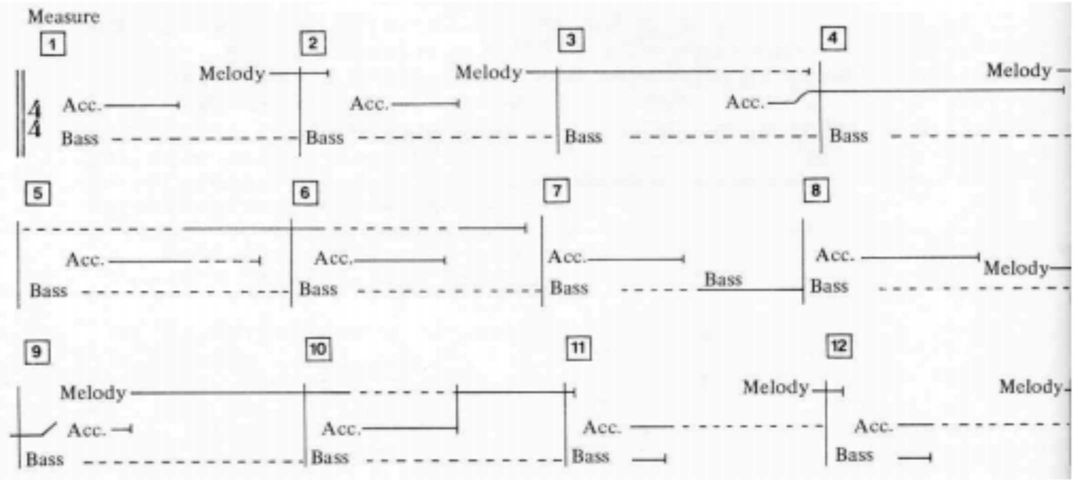


Figure 3.16 Towner's 'spotlight panning' illustration

3.1.7 Improvisational Approaches in *Pilgrim*

One of Towner's most recent tunes *Pilgrim* (2017) exemplifies this process in the context of (more-or-less) improvised passages. However, rather than maintaining two or three simultaneous voices, he interpolates chordal vamping with linear melodic ideas that flow back and forth into one another:

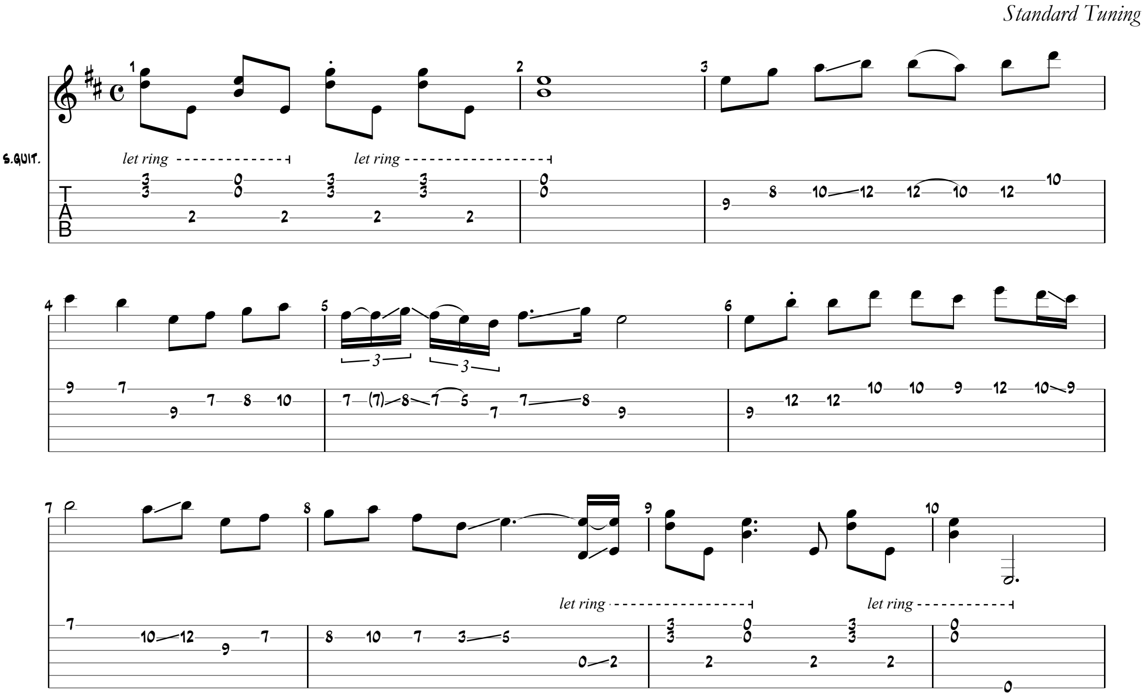


Figure 3.17 Pilgrim

Audio (B) 3.14 Pilgrim (1:26-1:48)

Here one can observe a clear delineation between parts. Bars 1-2 and 9-10 demonstrate the chordal vamping on an Em7 chord which bookends the E Dorian melodic ideas in the middle. There is minimal overlap between parts; the chordal vamp is secondary and only emerges when space is allotted to it by the melodic voice. That said, the E note played on the 4th string during the chordal vamp triggers the sympathetic resonance of the 6th string which sustains over the melodic voice.

3.1.8 'New Age' Harmony in *Beneath an Evening Sky*

Towner uses a range of harmonic devices to achieve an identifiable style. One, is the use of extended chords comprised of both stopped and open strings. Often at least two notes of the chord are voiced a whole- or half-step apart. As the instrument resonates with rich overtones the effect is an ethereal, otherworldly, or dream-like quality that has been termed *new-age harmony*. Although the term is problematic for various reasons, it is useful in that it brings to mind the sort of sound that is meant herein. In addition to Towner, Michael Hedges was also a proponent of this type of harmony, going so far as to change the tuning of his guitar for nearly every piece, to maximise the potential for the inclusion of open strings. In this sense timbre is as important a musical aspect as pitch or rhythm. Indeed Hedges' record label which heavily featured solo acoustic guitar music of this sort - Windham Hill Records – was categorised as *new age*.

Towner's *Beneath An Evening Sky* (1979) is a clear example of the implementation of new age harmony. Two open notes (B, E) carry throughout the entire piece (with one exception) threading together a series of nine chords:

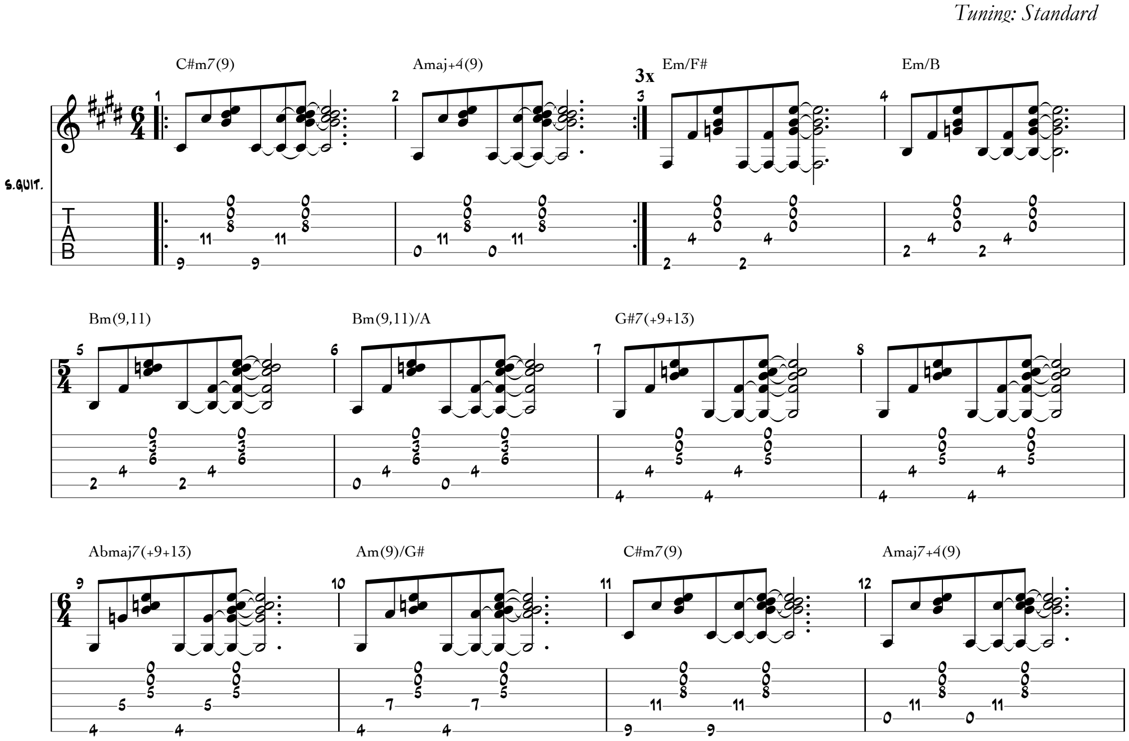


Figure 3.18 Beneath an Evening Sky

Audio (B) 3.15 Beneath an Evening Sky (Dionys Ensemble performance) (0:14-1:05)

In bars 1-2 the notes B, C#, D# and E are clustered together in close voicings. The B and E are open notes while the C# and D# are stopped notes. Therefore the timbre is exceptionally rich as the open notes (the most resonant) occupy the top and the middle of the chord with stopped notes in between. The top note is consistent throughout the entire piece, threading together a series of dissonant chords before returning to the C#m7(9) and Amaj7+4(9).

This is a technique Towner uses often: threading a series of otherwise disparate chords together with a common tone. As in *Beneath an Evening Sky,* he frequently initiates with some beautiful, pleasing harmonic progression utilising these *new age harmony* approaches and subsequently deviates into dissonant, sometimes jarring harmonies. For example, in bar 10 in the example above Towner creates maximum tension by employing a bitonal chord - Am(9)/G# - before releasing back to the C#m7(9). The Am(9)/G# contains both the open strings (B, E) but also has dominant function containing the first (G#) and third (B#) notes of the dominant chord in C# minor.

3.1.9 Linking Chord Progressions with Common-Tones in *Icarus*

Towner's tune *Icarus* (1973) is a classic example of this 'common-tone approach' to linking progressions together. Fig. 3.19 outlines the harmonic progression and voicings for my own arrangement of *Icarus* in DADGAD tuning, Because of the emphasis on harmony and voicing, rhythms and durations have largely been ignored.

Tuning: DADGAD

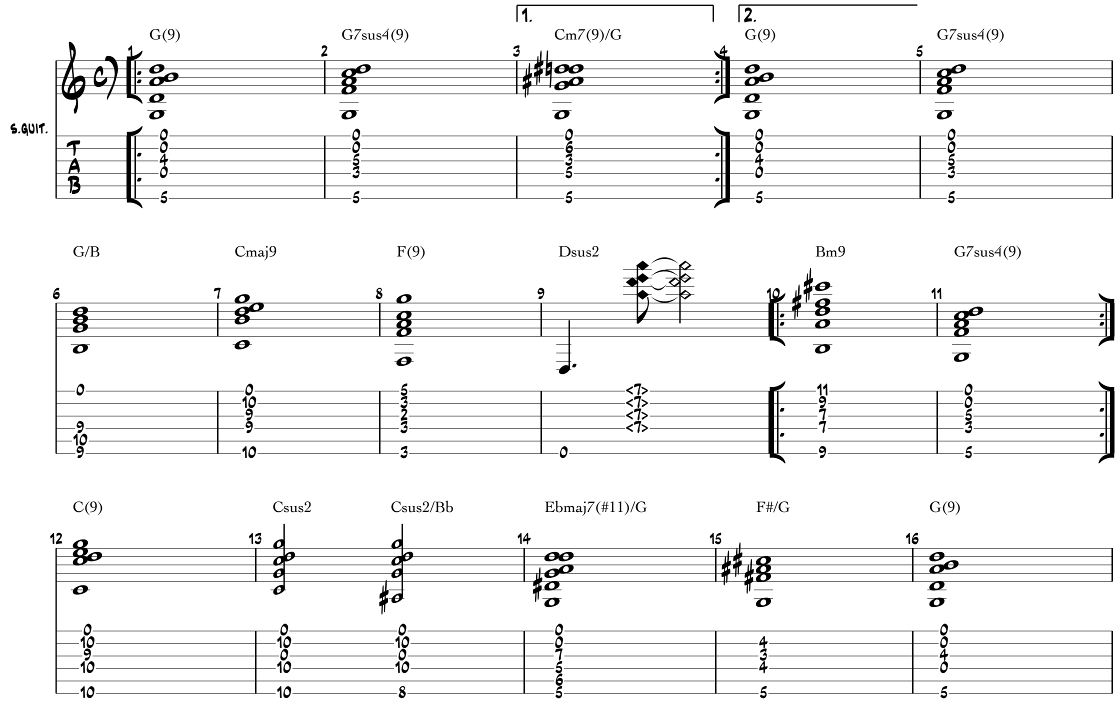

1.
2.
G(9)
G7sus4(9)
Cm7(9)/G
G(9)
G7sus4(9)
S.Guit.
G/B
Cmaj9
F(9)
Dsus2
Bm9
G7sus4(9)
C(9)
Csus2
Csus2/Bb
Ebmaj7(#11)/G
F#/G
G(9)

Figure 3.19 Icarus chords

Audio (B) 3.16 Icarus (Dionys Ensemble performance) (0:22-1:50)

In this example the open 1st string (D) rings throughout with few exceptions, creating an anchor point between chords. Furthermore, there is a G pedal tone in the bass which connects much of the harmony. Bars 14 and 15 lead back into bar 1 and therefore the G bass is sustained over nine changes (including repeats). Here again we see the last chord of the progression creating maximum tension with a sense of bitonality – the F# major triad over a G bass – and resolving back to the G(9).

In this arrangement I use a reverb pedal with a 'freeze' function to sustain the harmonics of bar 9 over the Bm9 chord in bar 10. This adds to the ethereality of the piece and creates a rich nine-note voicing which would be technically impossible on the guitar without the aid of the freeze function. The Bm9 becomes a Bm11 and is voiced as below:

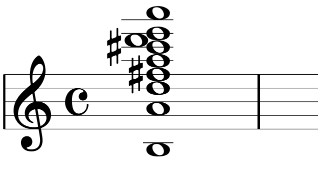


Figure 3.20 Bm11 voicing

In summary, Towner's work has been influential to my own practice in three main ways. One was his approach to solo fingerstyle guitar improvisation, in that primacy is given to one part at a time and that attention pans between parts (e.g. between bass, chordal accompaniment and melody) to maintain a sense of the whole. Next was his use of open strings when voicing chords to create rich dream-like textures which has been termed *new age harmony*. Finally was his use of common tones to link adventurous harmonic progressions together seamlessly, often including chords with a sense of bitonality to create maximum tension before returning to the top. Furthermore I demonstrated how, in my own arrangement of *Icarus* in DADGAD tuning, I have built upon these approaches by incorporating technology that allows me to expand chord voicings beyond what is technically possible on the guitar.

4 **METHODOLOGY**

4.1 OVERVIEW AND RESEARCH QUESTIONS

The following methodology employs a hybridised approach to developing vocabulary through improvisational approaches. This draws heavily on the psychological literature analysed in the literature review and will refer to psychological concepts when relevant. The idea was to devise a series of *heuristics,* based on the psychological literature which can be easily applied to my own practice, and indeed, any practice with some modification. The term 'heuristic' is used in a narrow sense in computer science and cognitive psychology, however, the term is used here in its broadest sense. Taleb (2012) writes that heuristics are "simplified rules of thumb that make things simple and easy to implement" (p.11). The idea is that heuristics *guide,* while leaving room for trial and error, or *tinkering* – a key part of the improvisatory process.

The research questions driving this hybridised methodological approach were developed in order to address the gaps identified in the literature and in practice. They are expressed as follows:

1. *How can I develop effective strategies for practice that encourage creativity, improvisation and flow?*
2. *How can I expand the harmonic, rhythmic and melodic vocabulary of contemporary steel-string fingerstyle guitar in new ways?*
3. *How can I assimilate these new approaches into my personal creative practice?*

In **part 1**, heuristics take the form of strategies for improvisation practice, termed *teleological* and *autotelic* practice. This was an effort to reconcile seemingly contradictory notions of *deliberate practice* and *flow* outlined in the literature review chapter. Taleb (2012), writing more generally of economics, politics, biology and philosophy, terms this a *barbell strategy:* "a combination of two extremes, one safe and one speculative, deemed more robust than a "monomodal" strategy" (p.428). The idea was to combine the methodical, mechanistic, analytical, safe, *teleological* practice; with the experimental, creative, risky, speculative, *autotelic* practice. To merge Taleb's language with my own terminology, *teleological practice* results in small, known, consistent gains, while *autotelic practice* results in occasional, large, unpredictable gains (in the form of creative breakthroughs).

Part 2 is an overview of the process of teleological practice . This is largely based on Berkowitz's (2010) model for acquiring improvisational skill. It comprises (1) devising modular vocabulary components, (2) transposition and variation of MVCs, (3) learning recombination principles and (4) practicing musical models. A single example is used – developed from a simple D major scale – to demonstrate this process in a linear fashion.

In **part 3**, the rhythmic palette is then expanded using a modification of the process above. The practice of Konnakol is introduced as a framework for developing more sophisticated rhythmic and percussive patterns.

Part 4 is a demonstration of the idea of musical dice games, used to generate and develop material as well as practice recombination principles.

4.2 PART 1: TELEOLOGICAL AND AUTOTELIC PRACTICE

The following section explores a biphasic approach to practice respectively termed *teleological* and *autotelic* practice. This was developed to address the apparent irreconcilable notions of *deliberate practice* and the *flow* state as highlighted by Ericsson himself (Ericsson, Krampe, Tesch-Romer, 1993, p.368). One key distinction between each of these concepts is the role of self-control and the perceived effort involved; the greater the self-control and deliberate allocation of attention, the greater the perceived effort. Deliberate practice aims at directing attention towards pre-formulated goals and is therefore inherently effortful - it is largely a function of *system 2* thinking.[13] Because of this key attribute it is herein termed *teleological practice.* During the flow state however, attention is not being consciously directed at anything but drawn towards the activity. It is being pulled by the activity, not pushed by the individual and is therefore experienced as effortless. The terminology used herein for practice carried out in a flow state is *autotelic practice;* practice that is done for its own sake, not for future rewards. Teleological practice deals with goal-directed, cognitively demanding activities but depletes energy resources. Autotelic practice nourishes creativity and intuition but is unpredictable and volatile. Therefore, the central thesis of this section is that both modes of practice can be engaged and structured in a way that is synergistic. That said, emphasis is given to flow, as its relationship to music *practice* is comparatively undocumented.

4.2.1 Exploring Practice Strategies: A Biphasic Approach to Improvisation Practice

Taking a multi-stage approach to practice is a common strategy for musicians. For example, Chaffin, Imreh and Crawford (2012) outline five stages of practice involved in preparing for performance of complex piano repertoire: (1) A single run through of the entire piece, (2) establish motor memory by chunking the piece into sections (3) develop automaticity in each section, (4) link sections together, (5) polish and refine entire piece, and (6) maintenance (p.239-246). However, the obvious differences between improvisation and performance of pre-composed material mean that practice for improvisation will diverge considerably from the above. The following operates under the premise that improvisation is a skill that can be learned through practice (Pressing, 1998). It attempts to synthesize material on flow, music practice and cognition in order to develop a method for structuring improvisation practice in a way that is conducive to flow.

---

[13] see Kahneman (2011) for detailed discussion on system 1 and 2 thinking

Berkowitz's (2010) model for the acquisition of improvisation skill (developed from 18th and 19th century pedagogy for keyboard improvisers) is used as a basis for the ensuing methods. To reiterate briefly, it comprises five stages: (1) the rote learning of formulas; (2) the transposition of formulas in various keys; (3) the variation of formulas; (4) the learning of recombination principles; and (5) the practicing of improvisational models. These are unpacked below:

1. Rote learning of formulas; formulas are archetypal patterns of a given musical style, 'equally useful for possible insertion into an improvisation and for transmission of fundamental aspects of the musical language in a distilled or simplified fashion' (Berkowitz, 2010, p28). The term 'modular vocabulary component' (MVC) will be used hereafter instead of 'formula' as it more accurately describes its function in this context.
2. MVCs are then transposed in all keys, making them available in various harmonic contexts and facilitating *knowledge compilation (defined as* 'progressive shift from the use of declarative knowledge to that of procedural knowledge, and an increase in automaticity' (Eysenck & Keane 2005, p.456))

3. MVCs must then be practiced with multiple variations. Again this serves a twofold function of providing note-for-note deployable devices and the implicit transfer of an underlying framework.
4. Learning of recombination principles; MVCs are combined to form larger structures. These larger structures are comprised of modular components which are interchangeable.
5. Practicing improvisational models; these are exemplars of typical improvisations, or allied compositions initially learned note-for-note. Models help transfer implicit knowledge from pedagogue to student in ways that cannot be transferred though prose (Berkowitz, 2010, p.74).

4.2.2 Phase 1: Teleological Practice

Associated flow dimensions: *challenge-skill balance, clear goals, proximal feedback, concentration on the task at hand*

This phase of practice involves rote learning of MVCs, their transpositions and any pre-formulated variations. These should be practiced at an appropriate tempo, and gradually increased just beyond a player's capabilities. Various 'aspects' may be practiced including dynamics, rhythmic vitality, articulation, ease, expressiveness (Klickstein, 2009). Recombination principles may be practiced in a similar fashion to a 'musical dice game'. Musical dice games were a common eighteenth century practice which provided a 'matrix of musical choices' for each bar, with a number given to each possibility. The player would roll the dice and 'compose' a piece bar by bar. (Berkowitz, 2010, p.65). In this way, an element of chance is introduced into the practice, keeping the challenge-skill balance in order, as well as providing clear goals, proximal feedback and maintaining/increasing concentration on the task at hand. On the other hand, if the player were to combine MVCs on a whim (i.e. attempt to improvise), flow dimensions *clear goals* and *proximal feedback* would diminish. The outsourcing of choice to chance frees up cognitive processing power and allows the player to focus on developing technique, dealing with novelty and internalising recombination principles. These should be practiced until a degree of automaticity and fluid execution of multifarious novel combinations has been achieved. A complementary practice involves learning and practicing improvisational models. These may be learned note-for-note though any recurring and/or identifiable devices and their development should be given special attention.

Phase 1 summary

- Rote learning of MVCs, their transpositions and variations;
- Gradual increasing of tempo and practicing of 'aspects';
- Practicing recombination principles by concatenating appropriate MVCs using etudes musical dice games;
- Automatization of MVCs and their concatenation;
- Practicing improvisational models, paying special attention to the improvisatory devices used and their development.

It should be noted that the four flow dimensions above align with what Ericsson and Pool (2016) define as *purposeful practice*. This involves taking a general goal, turning it into something specific and breaking it down into a series of manageable steps (p.15). The other criteria outlined for purposeful practice are focus, direct feedback and "getting out of one's comfort zone" (p.15-17). Note that these exactly align with flow dimensions; *clear goals, concentration on the task at hand, proximal feedback* and *challenge-skill balance*. However Ericsson et al. (1993) claim that *deliberate practice* – a form of purposeful practice that "develops skills that other people have already figured out how to do and for which effective training techniques have been established" (Ericsson & Pool, 2016, p.99) – is "almost antithetical" to the "state of diffused attention" associated with flow (Ericsson et al., 1993, p.368). Here, Ericsson et al. make the assumption that the concentration of attention is inherently effortful, which appears to be false in view of recent literature: concentration of attention may be maintained or increased with a decrease in subjective effort (see section above: *Attention and Effortlessness*).

Furthermore the authors claim that "deliberate practice requires effort and is not inherently enjoyable" (p.368) and indeed, this does seem to set it apart from flow. However, in the biphasic method presented herein, it is suggested that phase 1 *does* include effort and therefore may not be initially enjoyable. This notion is influenced by Dietrich's (2004) observation that volitional control of attention may be used to narrow focus, exclusively buffering the task at hand and stopping other impediments from entering into consciousness (p.758). One final point is that deliberate practice may in fact be too rigid to allow for flow experience in that it follows established training techniques set forth by others. *Purposeful* practice, however, is a heuristic approach allowing for some degree of exploration while maintaining clear goals.

4.2.3 Phase 2: Autotelic Practice

Associated flow dimensions: *challenge-skill balance, concentration on the task at hand, action-awareness merging, a sense of self-efficacy, loss of self-consciousness, time distortion, autotelic experience.*

One key distinction between the above phase of practice and the current one, is the decrease in perceived effort accompanied by a maintenance or increase in performance effectiveness. A degree of automaticity has been developed from phase 1 and practice may seem less effortful. However, attention should still be focused, if not implicitly, then explicitly. To maximise potential for flow induction, attention should be directed away from technical concepts (thinking in 'MVCs' and 'recombination principles') towards an external focus (i.e. the sounds produced) or an internal mindful focus (i.e. neutral observation of bodily movements). Self-criticism, even self-evaluation should be all but absent as attention is entirely wrapped up in the task at hand. Here one is beginning to practice the act of musical improvisation itself. MVCs, variations and recombination principles have been proceduralised and are available without deliberation. As such this process will be much less definite than the previous one, leaving room for exploration and risk-taking.

Werner (1996) outlines four steps for developing mastery in musical performance which are particularly applicable to this phase of improvisation practice. Step one begins with a meditation designed to relax the body and put the musician into what is essentially an autotelic state. The meditation contains the affirmation "every note I play is the most beautiful sound I've ever heard" (p.121) which corresponds to flow dimension, *a sense of self-efficacy*. Similarly he suggests "[letting] go of the need to be a great player" (p.135) which corresponds to *autotelic experience*. He then advocates lifting one's arm and hovering it over the instrument, imagining that one is not the agent of their actions. An individual may then play their instrument, but only one finger at a time, and with a sense of total effortlessness, observing their actions neutrally, without any sense of conscious control (p.135-137).

In step two, Werner suggests '[practicing] flying without worrying about flight patterns' (p.145). In other words playing with a sense of aimlessness or purposelessness, with no regard for the aesthetics of the outcome:

> Simply allow your hands to make random choices. Whether it be free improvisation, the repetition of one chord, or the simplest diatonic melody, those choices will be made from your hands, lips or vocal chords – but not from your head. There will be no intentionality in them. Rather it will be as if you are asleep, but your hands are moving around the instrument. […] you aren't involved. You are only an observer. (p.145-146)

Step three involves playing only what one can play, from a place of detachment and effortlessness. Werner posits that this step is about, "honest expression, the stripping down of our playing to only that which wants to be expressed" (p.152). In other words, at this stage, one shouldn't strive to play anything beyond one's capabilities, but remain focused on effortlessness and detachment. Step four requires taking small samples of things just beyond the level of mastery and '[absorbing] them on the level of mastery' (p.160). For this Werner employs a 'learning diamond' (p.161) which denotes four aspects of practice: effortlessness, perfection, amount of material, and speed. Werner advocates that any of these may be sacrificed when attempting something beyond one's reach *except for effortlessness*, which remains invariable throughout the process.

For the most part, Werner's model for practice appears to be highly conducive to improvisation practice, indicating many of the flow dimensions and facilitating the creative, exploratory side of improvisation practice. Any novel material created during the improvisational explorations may be fed back into phase 1 of the practice and used to develop further variations. For this reason it is recommended that this phase of practice is recorded and reviewed for any outstanding moments.

Phase 2 summary

- The cultivation of an autotelic mind-set: releasing the need to achieve any goal, musical or otherwise (via mediation, affirmations etc.);
- A focus on effortless execution: playing easy material, focusing on a sense effortlessness. Attention can be directed externally towards the sounds produced, or internally, towards neutral observation of the movements;
- Fostering unselfconsciousness: free improvisations with no regard for the outcome of the sounds produced;
- Restoration of the challenge-skill balance: taking risks, developing material in any direction, according to creative impulse.

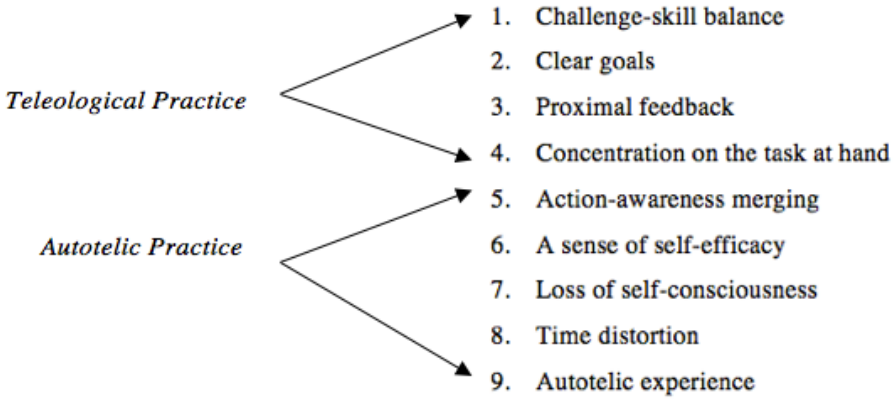

Teleological Practice
Autotelic Practice
1. Challenge-skill balance
2. Clear goals
3. Proximal feedback
4. Concentration on the task at hand
5. Action-awareness merging
6. A sense of self-efficacy
7. Loss of self-consciousness
8. Time distortion
9. Autotelic experience

Figure 4.1 Flow dimensions and corresponding practice phases

Teleological practice largely corresponds to *task preconditions* (dimensions 1, 2, 3) and *cognitive preconditions* (4) while Autotelic practice largely corresponds to *experiences* (5, 6, 7, 8, 9) but also to dimension 1. Therefore teleological practice is largely task-orientated and autotelic practice is largely experience-orientated.

4.3 PART 2: DEMONSTRATION OF TELEOLOGICAL PRACTICE

4.3.1 Step 1: MVCs, Specialist Memory and the Knowledge Base

The modular vocabulary component (MVC) refers to a small fragment of vocabulary that is adaptable to various contexts and variable across a potentially unlimited number of dimensions. It is modular in the sense that it is an independent unit that can be applied to various systems (in this case, a given musical context) by concatenating strings of MVCs. MVCs are analogous to Berkowitz's 'formulas'. Step 1 involves the conception and learning of MVCs.

The idea is to first expand *specialist memory* (Pressing 1998) by learning theoretical concepts. For example, specialist memory was expanded in the *Overview of Key Influences* when exploring the harmonic devices used by Towner. The next step is to develop the *knowledge base* (Pressing 1998) by converting theoretical knowledge into short useable techniques; i.e. the conception and learning of MVCs. Finally, as practice ensues, the process of *knowledge compilation* begins to occur (see Eysenck & Keane, 2005: 455-459) in which knowledge shifts from declarative to procedural, becoming less conscious and more automatic.

The following demonstrates this process using a simple D major scale figure in DADGAD tuning. A single tuning was chosen for the majority of the work presented in this thesis to allow a build-up of associations between the cognitive processing structures. Altering the tuning of the guitar changes the position of scales, chords and arpeggios and therefore the player has less opportunity to build up associations. Using a single tuning allows one to conceive of, and link, each musical event in terms of its acoustic properties, musical properties and movement properties (see Pressing, 1998). DADGAD is particularly advantageous in that it is neutral sounding, and contains only three notes: D, A, G.

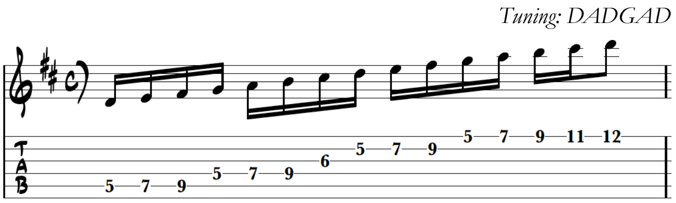


Figure 4.2 MVC 1A: D major scale

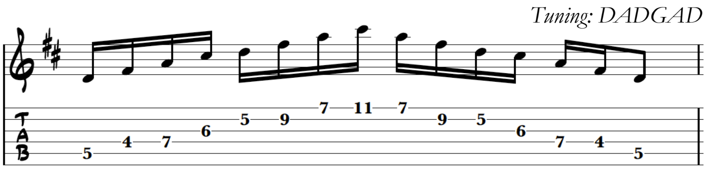


Figure 4.3 MVC 1B: Dmaj7 arpeggio

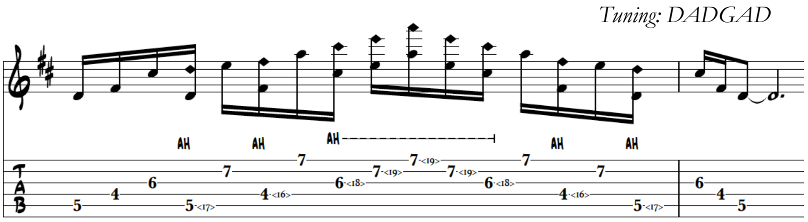


Figure 4.4 MVC 1C: Dmaj9 arpeggio with harp technique

4.3.2 Step 2: Transposition, Variation and Schema Theory

This step involves transposition and variation of the established MVCs. Transposing each MVC serves the obvious function of making them available in various harmonic contexts. Variation functions both to develop new vocabulary and to instantiate improvisatory principles. It generates new vocabulary by altering some aspect across any number of musical dimensions (e.g. timbral, intervallic, rhythmic etc.), which can, in turn, be altered again. Thus any MVC has potentially infinite possibilities for development and therefore only a limited vocabulary is necessary for limitless possibilities: a small number of rules applied to a single entity results in surprising complexity (Holland, 1998, p.3).

Secondly, variation instantiates improvisatory principles by developing a schema; rather than storing every single motor pattern for every single variation, a generalised motor program (GMP) is stored for a given movement *class*. The more movement variations that are practiced the stronger the abstracted schema becomes. In other words, practicing many variations of a given figure fortifies the general framework of it; the invariants become more deeply engrained.

Tuning: DADGAD

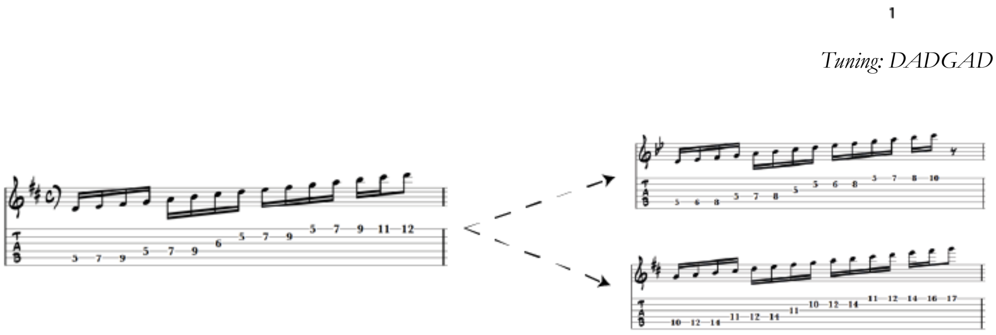


Figure 4.5 D major scale: modal and diatonic transposition

Tuning: DADGAD

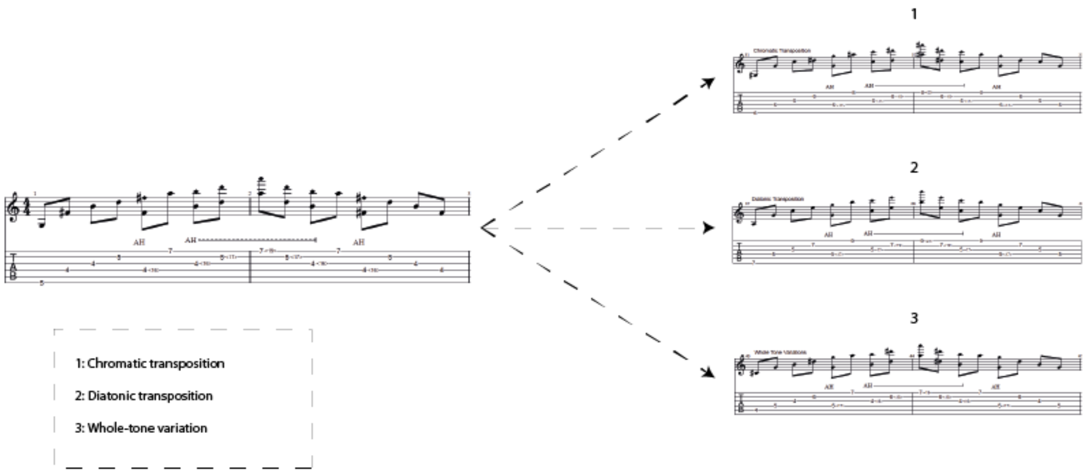

1
2
3
AH
1: Chromatic transposition
2: Diatonic transposition
3: Whole-tone variation

Figure 4.6 Gmaj9 arpeggio transposition and variation

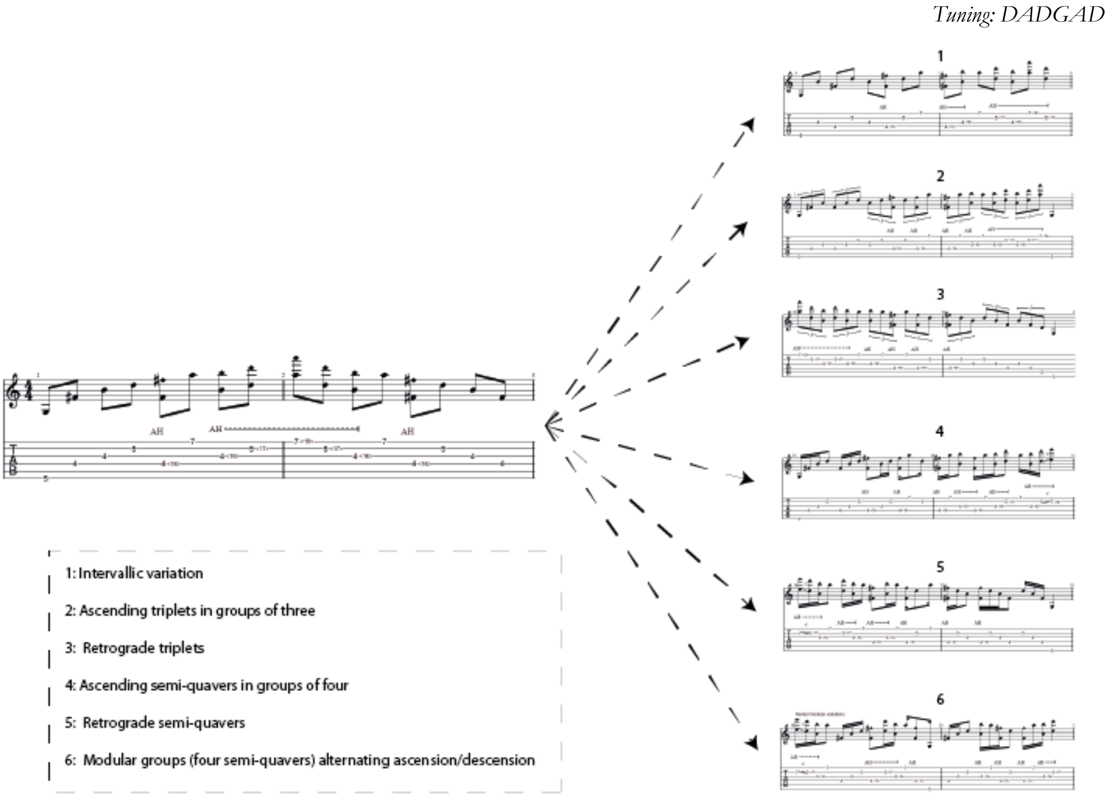

Tuning: DADGAD
1
2
3
4
5
6
AH
1: Intervallic variation
2: Ascending triplets in groups of three
3: Retrograde triplets
4: Ascending semi-quavers in groups of four
5: Retrograde semi-quavers
6: Modular groups (four semi-quavers) alternating ascension/descension

Figure 4.7 Gmaj9 arpeggio further variations

For individual examples of variations refer to section 2. HHT Variations (Examples 1-16) in Volume II: Transcription Portfolio

4.3.3 Step 3: Learning Recombination Principles via Improvisatory Etudes.

This step involves learning grammatical rules for the concatenation of MVCs into longer sections. This is both an explicit (declarative) and implicit (procedural) process which can be learned through the conception and practice of improvisatory etudes. The conception of improvisatory etudes forces one to impose certain musical processes or rules onto pre-existing MVCs and their variations (for example, the rules of diatonic harmony). Practicing the etudes allows one to develop the procedural memory to internalise these rules and build up cognitive redundancy by forming links between the discrete elements of his/her knowledge base (see Berkowitz, 2010, p.68). An excerpt from 'etude #2' is displayed below. This demonstrates the application of an MVC (in this case, one based on the harp harmonic technique) to various harmonic processes (i.e. diatonic/chromatic progressions)

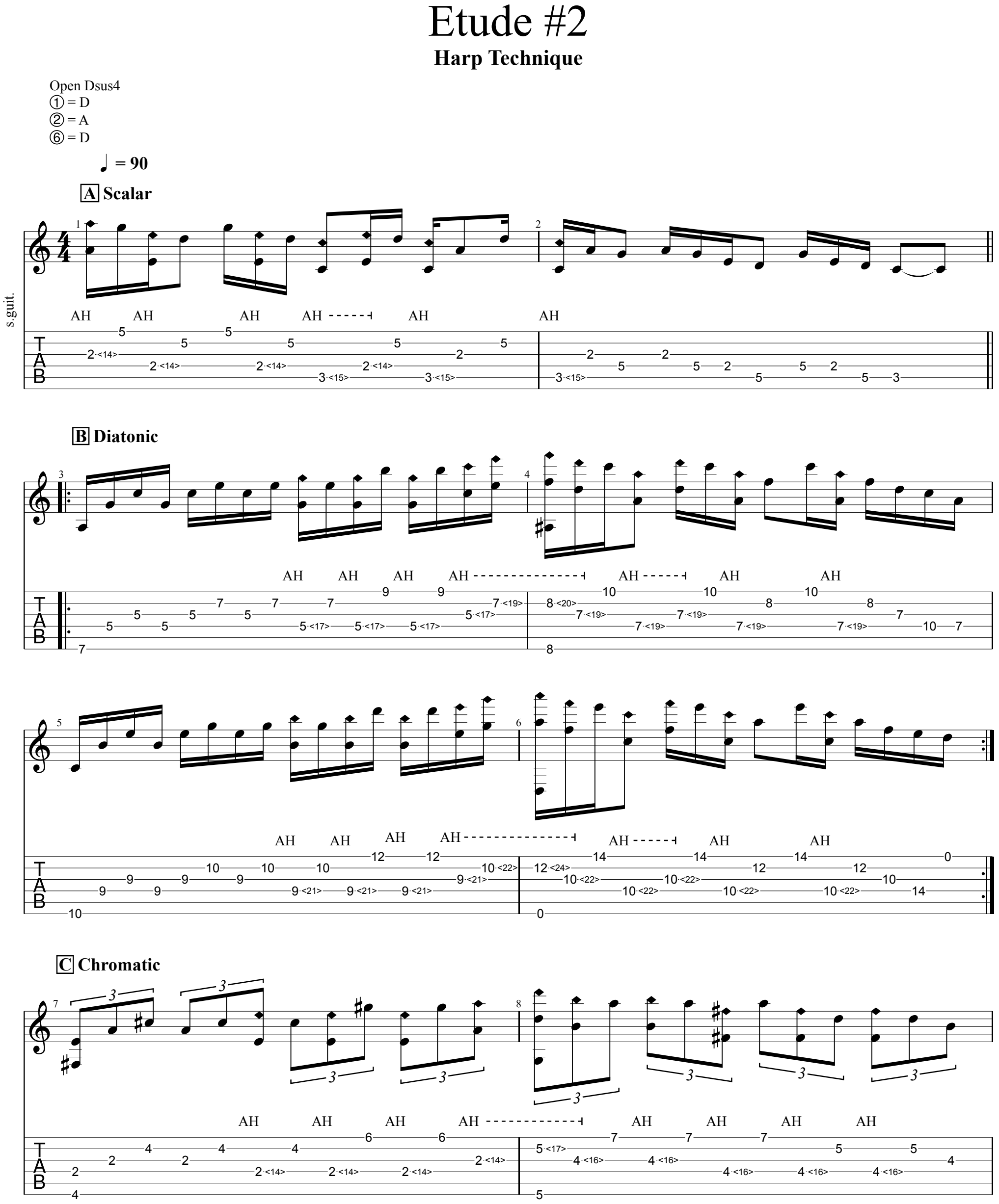

Etude #2
Harp Technique
Open Dsus4
① = D
② = A
⑥ = D
♩ = 90
A Scalar
B Diatonic
C Chromatic
s.guit.
AH

Figure 4.8 Etude #2

Audio (B) 4.1 Etude 2

4.3.4 Step 4: Practicing Improvisational Models

This step involves learning exemplars of typical improvisations or allied compositions, initially note-for-note. Models help transfer implicit knowledge in a way that cannot be explicitly communicated. They help inspire MVCs as well as internalise recombination principles, thus they can be used both as a practical tool and as a source of inspiration and creativity.

John McLaughlin's piece *A Lotus on Irish Streams* was selected as a model improvisation due to the rich harmonic vocabulary, the free-time feel and the pianistic flourishes which lend themselves to the harp harmonic technique developed earlier. The original was written for guitar, piano and violin but has been arranged for solo guitar. An excerpt from the transcription (fig. 4.9) is presented on the following page, demonstrating the harmonic and melodic realisation of the piece in DADGAD tuning, with frequent use of the HHT to execute arpeggios.

4.3.5 Summary

Teleological practice for the development of new improvisatory vocabulary has been presented in 4 steps: (1) conception and learning of MVCs, (2) variation and transposition of MVCs, (3) learning recombination principles and (4) practicing musical models. Each of these steps serves a particular psychological and musical function in terms the development of new vocabulary through improvisatory approaches. Because of the emphasis on harmonic/melodic vocabulary in this section, the following section will develop the rhythmic/percussive vocabulary.

Lotus on Irish Streams

McLaughlin (arr. Lutton)

Open Dsus4
① = D
② = A
⑥ = D

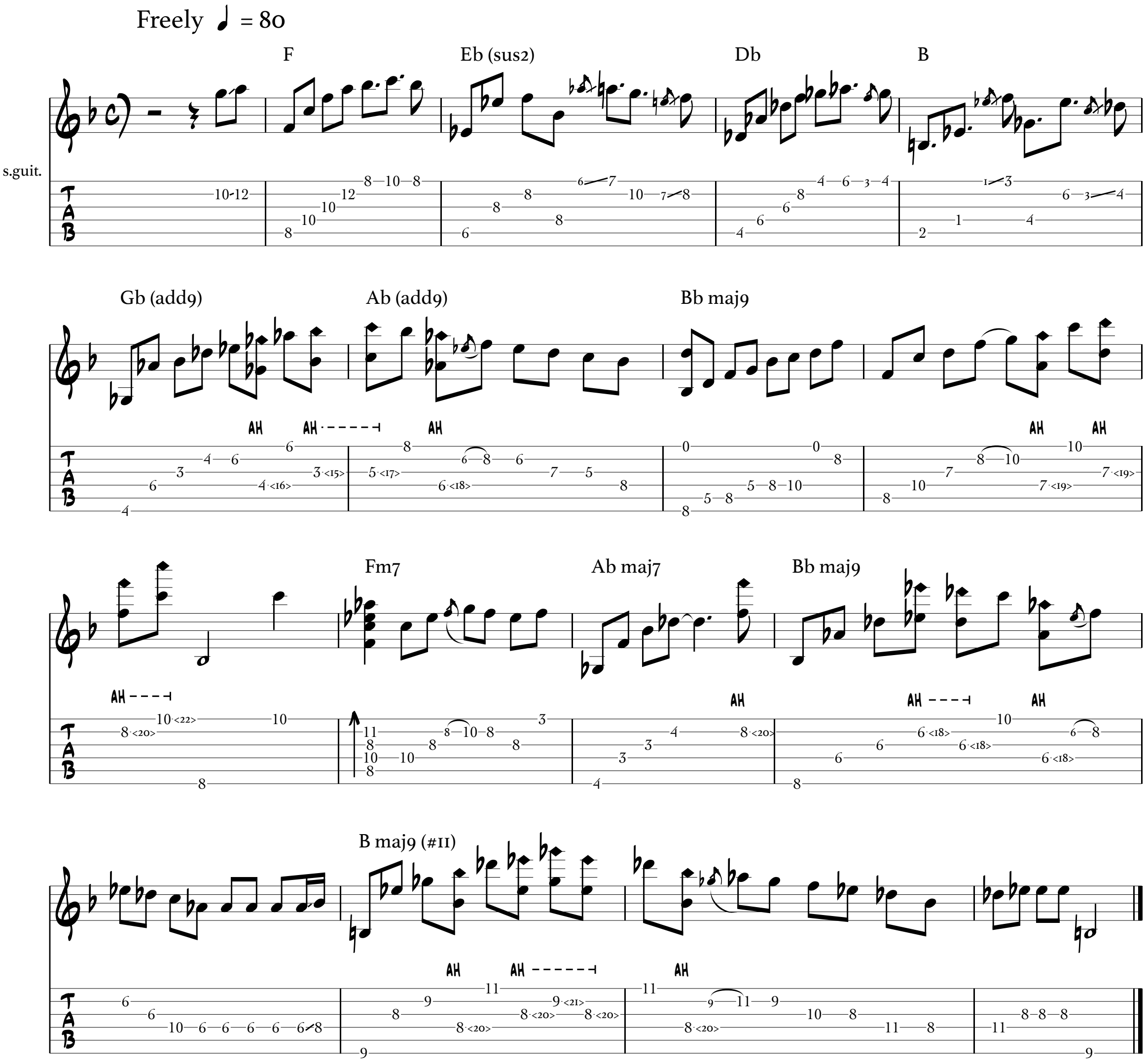

Freely ♩ = 80
F
Eb (sus2)
Db
B
s.guit.
Gb (add9)
Ab (add9)
Bb maj9
AH
Fm7
Ab maj7
Bb maj9
B maj9 (#11)

Figure 4.9 A Lotus on Irish Streams ex.1

Audio (B) 4.2 A Lotus on Irish Streams

4.4 PART 3: DEVELOPING THE RHYTHMIC PALETTE

4.4.1 Mapping Konnakol Phrases to Percussive Guitar Techniques

Percussive techniques are often viewed as a cornerstone of contemporary fingerstyle guitar. They are often employed in ways that mimic a pop/rock drum kit (kick and snare) and are therefore rudimentary in nature. The following methods aim to enhance the rhythmic palette of my own practice in a way that is improvisatory. Established techniques developed by players such as Thomas Leeb, Petteri Sariola and Eric Mongrain are repurposed for use in an improvisatory context. These techniques, normally found in 4/4 time signature in common formations, are made applicable to various rhythmic contexts allowing for a greater range of possibilities. The Carnatic tradition of vocal improvisation termed *Konnakol* is used as a template for rhythmic development. Konnakol consists of improvising groups of syllables over a set meter. The groups used herein are sets of 2, 3, 4, 5, 6, 7 in any combination in any plausible subdivision (quaver, semiquaver etc.).

2 = Taka

3 = Takita

4 = Taka Dimi

5 = Da Di Gi Na Dum

6 = Da - Di Gi Na Dum

7 = Da - Di - Gi Na Dum

Each syllable is mapped onto a specific percussive guitar technique. For example, the first *Ta* or *Da* in any pattern corresponds to the percussive guitar technique *thumb down* (TD) or *bass thump* (BT). An even pattern, for example that of two (*Taka*), could be executed very simply with a chopping motion: *thumb down* (TD)*, middle up* (MU). The idea is that the executing hand is in constant flow, never repeating the same two events in a row. For this reason, odd patterns, for example a pattern of three (*Takita*), must include a third motion. *Takita* should be executed as: *thumb down* (TD) *thumb up* (TU) *middle up* (MU), for the subsequent pattern to begin on *thumb down* (TD). A basic framework is indicated below:

2 = Taka = TD MU

3 = Takita = TD TU MU

4 = Taka Dimi = TD MU BT MU

5 = Da Di Gi Na Dum = TD MU TD TU MU

6 = Da - Di Gi Na Dum = TD TU MU BT TD MU

7 = Da - Di - Gi Na Dum = TD MU BT MU TD TU MU

Audio (B) 4.3 Konnakol example phrases

Once the associative links between Konnakol phrases and percussive guitar techniques have been made and automatized, one can begin practicing linking phrases together. Some examples are given below.

1				**2**				**3**				**4**			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ta	Ki	Ta	(Ta)	(Ka)	Da	Di	Gi	Na	Dum	Da	Di	Gi	Na	Dum	(Ta)

Figure 4.10 Konnakol development ex.1

1				**2**				**3**				**4**			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Da	-	Di	-	Ge	Na	Dum	Ta	Ki	Ta	Ta	Ki	Ta	Ta	Ki	Ta

Figure 4.11 Konnakol development ex.2

Key: top row = pulse, middle row = subdivision, bottom row = phrase groups. Phrases in parenthesis are silent.

4.4.2 Developments: Timbral Variations

Further development is needed in terms of timbral variation and rhythmic variation. Timbral variation refers to the percussive techniques. So far these techniques have been executed as body percussion and string slapping, which is often bland and harsh-sounding. Through experimentation the model was adapted to include the following:

- Events on beat 1 can be played with a down-strum of the relevant chord;
- Middle finger up (MU) can be occasionally replaced with a slap harmonic;
- All other events can be played in one of three ways: (1) bass strings only–allowing treble strings to resonate, (2) body percussion only–allowing a full chord to resonate, or (3) a combination of both.

Each example should therefore be practiced in three ways:

- Strum chord on beat 1 with all subsequent events to be played as bass notes;
- Strum chord on beat 1 with all subsequent events to be played as body percussion;
- Strum chord on beat 1 with all subsequent events to be played as alternating combinations of bass notes and body percussion.

Alternating between bass notes and body percussion works best in small groups. Instead of alternating between a group of five (bass notes) and a group of seven (body percussion), these should be further subdivided into groups of two and three. For instance, *Da Di Gi Na Dum* can be played with body percussion for *Da Di* and bass notes for *Gi Na Dum:*

Da	Di	Gi	Na	Dum
BP	***BP***	***BN***	***BN***	***BN***
TD	MU	TD	TU	MU

Figure 4.12 Konnakol development ex.3

Key: BP = Body percussion, BN = Bass notes

4.4.3 Developments: Rhythmic Variations

Further developments are needed to widen the rhythmic palette and sustain interest. The first of these is simply the introduction of silent phrases or gaps. These are indicated in parenthesis:

1				**2**				**3**				**4**			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ta	Ki	Ta	(Ta)	(Ka)	Da	Di	Ge	Na	Dum	Da	Di	Ge	Na	Dum	(Ta)

Figure 4.13 Konnakol development ex.4

The second rhythmic development is the introduction of faster events. The cornerstone of this is an adaptation of a technique widely used in flamenco guitar called the *rasgueado.* Successive fingers are fired in sequence resulting in a quick, percussive outburst - e.g. ring (a), middle (m), index (i). I have adapted the rasgueado for use in multiple situations:

Rasgueado device 1: Rg

The succeeding phrase after any gap may be initiated with a rasgueado sequence on the top of the guitar (a-m-i). Played with a slight push, the rasgueado will be before the beat, with TD coming in on the beat as normal.

Rasgueado device 2: R2

Any pattern of *Taka* may be replaced with BT and *Rg* in succession.

Rasgueado device 3: Rx

This is a rasgueado followed by TD TU MU in quick succession.

Rasgueado device 4: *bRx*

Bass thump (BT) for quaver duration followed by Rx.

4.4.4 Rhythmic Formulas

bRx lasts for one beat. If the smallest Konnakol subdivision employed is a semiquaver we can deduce that bRx assumes four of these. bRx for practical use will be written as bRx(4). Using this formula means that these rasgueado devices can more easily be assimilated with Konnakol groups while maintaining an awareness of meter. The formula for a given phrase might appear as follows:

bRx(4) + 3 + 4 + 5 = 16

The technical requirements governing this system maintain that every group must initiate with a down motion (TD or BT) and finish with an up motion (TU or MU). *Rx* can only be used after a gap as it initiates with the ring finger. Because bRx(4) starts with BT it can be used as substitution for *Ta Ka Di Mi.*

bRx(4) + 5 + (2) + 5

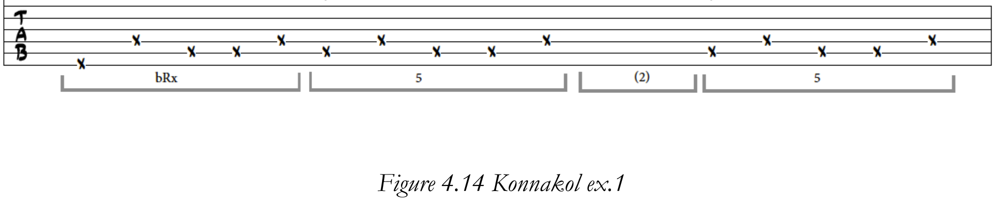


Figure 4.14 Konnakol ex.1

bRx(4) + 7 + (2) + 3

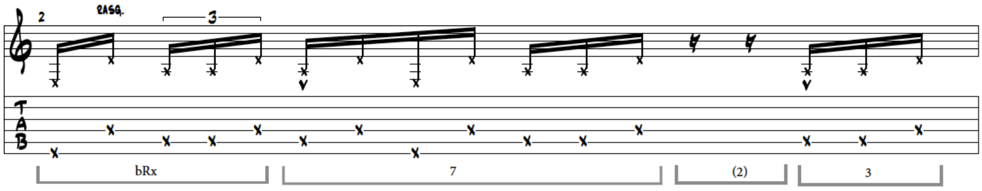


Figure 4.15 Konnakol ex.2

Thus fairly sophisticated rhythmic sequences have been distilled into formulas for use in a completely novel context. These should be practiced in various incarnations, much in the same way scales are practiced. Some examples of this are indicated below.

1 bar sequences with example silent phrases:

3 + (2) + 3 + 2 + (3) + 3

2 + (2) + 3 + 3 + (2) + 4

5 + 2 + (2) + 3 + 2 + (2)

3 + (2) + 3 + 2 + (2) + 3

2 bar sequences (silent phrases employed at will):

5 + 7 + 5 + 7 + 5 + 3

5 + 4 + 5 + 7 + 5 + 6

5 + 5 + 5 + 5 + 5 + 5 + 2

7 + 7 + 7 + 7 + 4

Guidelines for practice:

- Any group of 2 or 3 can be silent phrases
- Groups of 2 or 3 can alternate between BP and BN
- Groups of 4, 5, 6, 7 can be subdivided into BP and BN
- Any sequence after a gap can be initiated with Rg.
- Any group of 2 can be replaced with R2

- Any group of 4 can be replaced with bRx

Listening examples:

Audio (B) 4.4 Konnakol ex.1

Audio (B) 4.5 Konnakol ex.2

Audio (B) 4.6 Konnakol ex.3

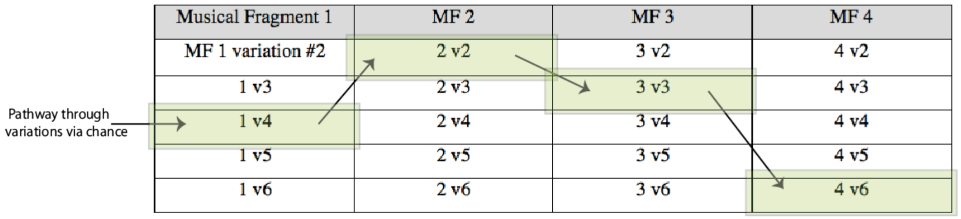
Audio (B) 4.7 Konnakol ex.4

4.5 PART 4: MUSICAL DICE GAMES

The approaches used in this section are influenced by a number of sources including Mermikides (2010), McKnight (2012), Williams (2017), Ericsson, Krampe, Tesche-Romer (1993), Schmidt (1975), Berkowitz (2010) and many others. The idea is that every musical idea has an inherent set of properties, each of which can be varied across multiple dimensions. Each variation can then be modified to produce more variations and so on. Berliner (1991) for example notes that players may extract a figure's "salient characteristic" and "treat it as the rudiment for new figures." (p.146). In cognitive-motor terms, this is analogous to Schmidt's (1975) *generalised motor program* in which a given movement *class* is stored and remains parametrically tuneable across a number of dimensions. For instance, a given musical figure with a salient rhythmic structure may be chromatically transposed by moving up or down the guitar fretboard, keeping the rhythmic and intervallic structures intact.

The following section presents a series of musical ideas captured from recorded sessions. Each session was a 'free' exploration of a musical idea, style, or technique and was recorded using a Zoom H4N. Recordings were then mined for any musical fragments which were particularly interesting, applicable or aesthetically pleasing. Once a fragment had been extracted, transformational processes were applied to a specific aspect to generate subsequent material. The specific aspects were termed *dimensions of variability,* with each dimension referring to a particular musical/technical/acoustic aspect (melodic variation, textural variation etc.). Once sufficient material was generated, it was practiced to the point of automaticity.

A series of improvisational exercises or "musical dice games" (see Berkowitz, 2010) were then constructed. This involved a short piece (e.g. 8 bars) of pre-composed music based on the material previously generated. However, each fragment (e.g. 2 bars) is presented with multiple variations and a pathway through the piece is chosen by selecting variations at random (or via the roll of a dice).



Musical Fragment 1	MF 2	MF 3	MF 4
MF 1 variation #2	2 v2	3 v2	4 v2
1 v3	2 v3	3 v3	4 v3
1 v4	2 v4	3 v4	4 v4
1 v5	2 v5	3 v5	4 v5
1 v6	2 v6	3 v6	4 v6

Figure 4.16 Model for musical dice games matrix

Broadly speaking there are five steps in this method:

1. Free exploration of ideas/techniques/styles encouraging creativity and the engagement of intuitive faculties;
2. Systematic development of material by varying a musical fragment across multiple dimensions;
3. Deliberately increasing one's vocabulary by learning variations using purposeful practice strategies;
4. Variable practice methods as a springboard to improvisation: "musical dice games" introduce spontaneous variation in controlled doses in a way that is learnable;
5. Improvisation can begin to take place using the musical model established. Creativity can re-emerge and players can experience *flow* and all the benefits therein.

Audio (B) 4.8 Diabaté-style free improvisation

4.5.1 Musical Fragment 1

This fragment was influenced by the music of Toumani Diabaté, a Malian Kora player and composer/improviser. It consists of a simple melodic phrase in D Dorian over a repetitive swung picking pattern. The melody is scored on a separate stave to allow for easy manipulation of phrasing.

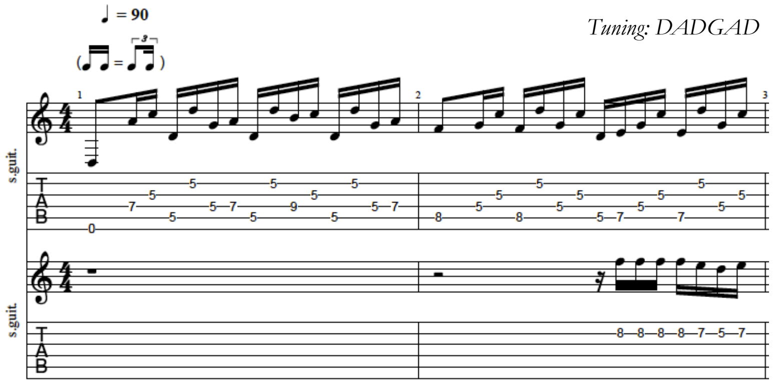

♩ = 90
Tuning: DADGAD
s.guit.
s.guit.

Figure 4.17 Musical fragment 1: Diabaté-style

Audio (B) 4.9 Musical Fragment 1: Diabaté-style

4.5.2 Dimensions of Variability

The diagrams below represent the transformational processes applied to a single musical phrase influenced by those found in Mermikides (2010) in what he terms *musical refractions*. There are six initial 'refracting pathways' each of which can generate new pathways: The reader can refer to section 3*: Diabaté-Style Variations (Examples 1-20)* of Volume II for individual transcriptions of each variation.

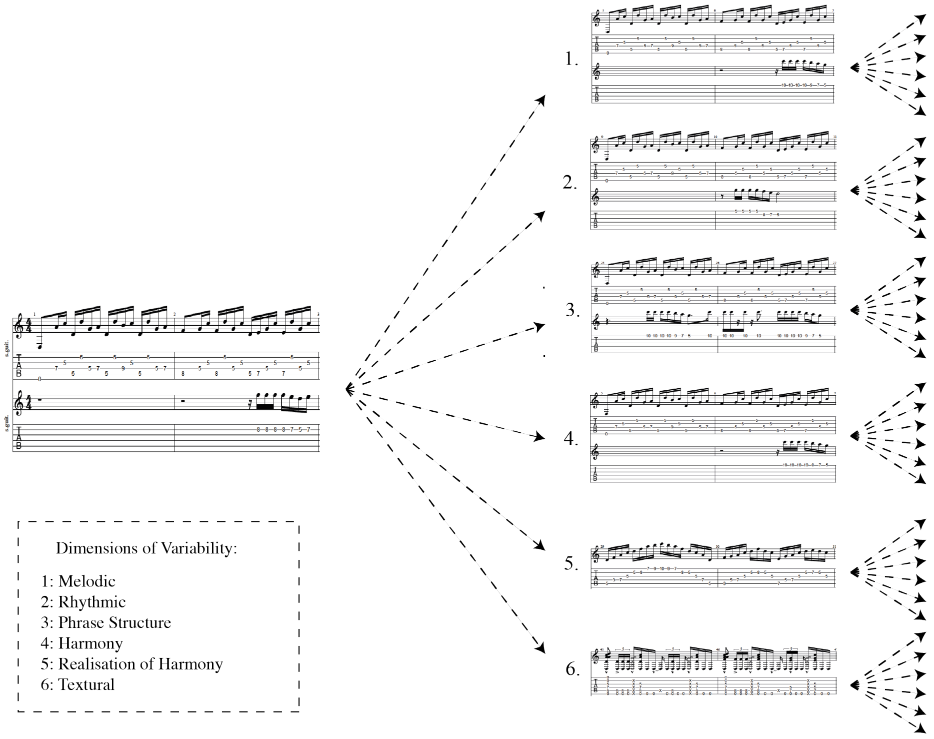

1.
2.
3.
4.
5.
6.
Dimensions of Variability:
1: Melodic
2: Rhythmic
3: Phrase Structure
4: Harmony
5: Realisation of Harmony
6: Textural

Figure 4.18 Dimensions of variability

Refracting pathways: (1) *melodic variation*, (2) *rhythmic variation of melody*, (3) *variation of phrase structure,* (4) *harmonic variation*, (5) *realisation of harmony*, (6) *textural variation.*

Further refracting pathways are indicated below. The example given is four variations on dimension 2: *rhythmic variation of melody*. It consists of (2.1) *rhythmic displacement*, (2.2) *rhythmic displacement,* (2.3) *rhythmic expansion,* (2.4) *rhythmic contraction/repetition.*

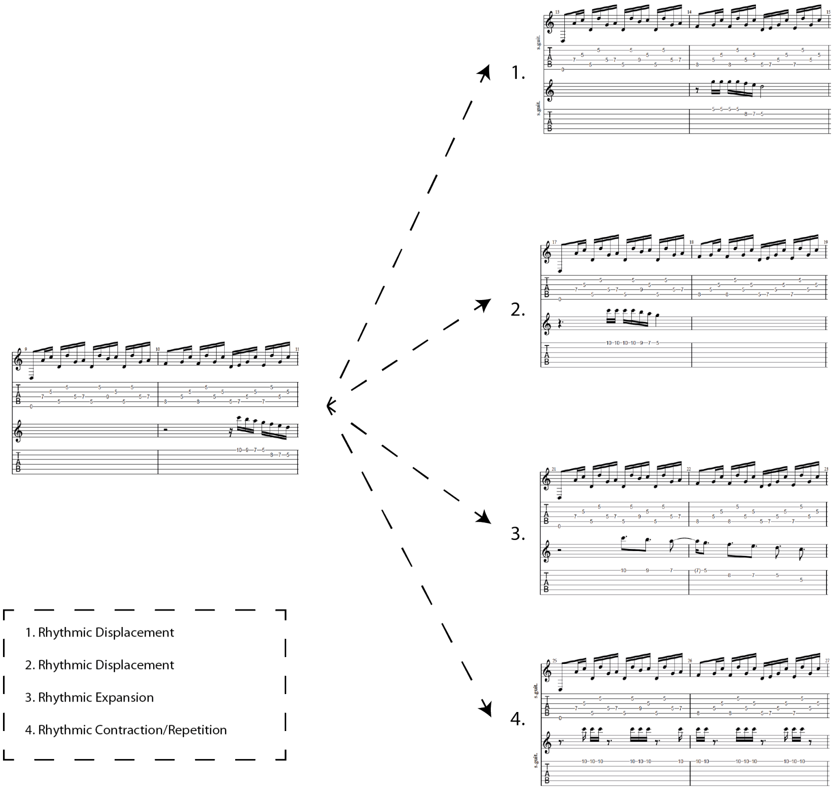


Figure 4.19 Further refracting pathways on dimension 1: rhythmic variation of melody

4.5.3 Musical Dice Games Matrix

Below is an example of a *musical dice games matrix*. It comprises variations of a two-bar musical fragment in four columns, totalling eight bars of music. This is the horizontal axis and represents the music *in time* from left to right. The vertical axis contains six variations of every two-bar musical fragment. This results in 6^4 (1296) possible outcomes demonstrating the idea that a "small number of rules or laws can generate systems of surprising complexity" (Holland, 1998, p.3). One iteration of this is demonstrated in fig. 4.20. Further iterations can be found in section 4: *Musical Dice Games* of Volume II.

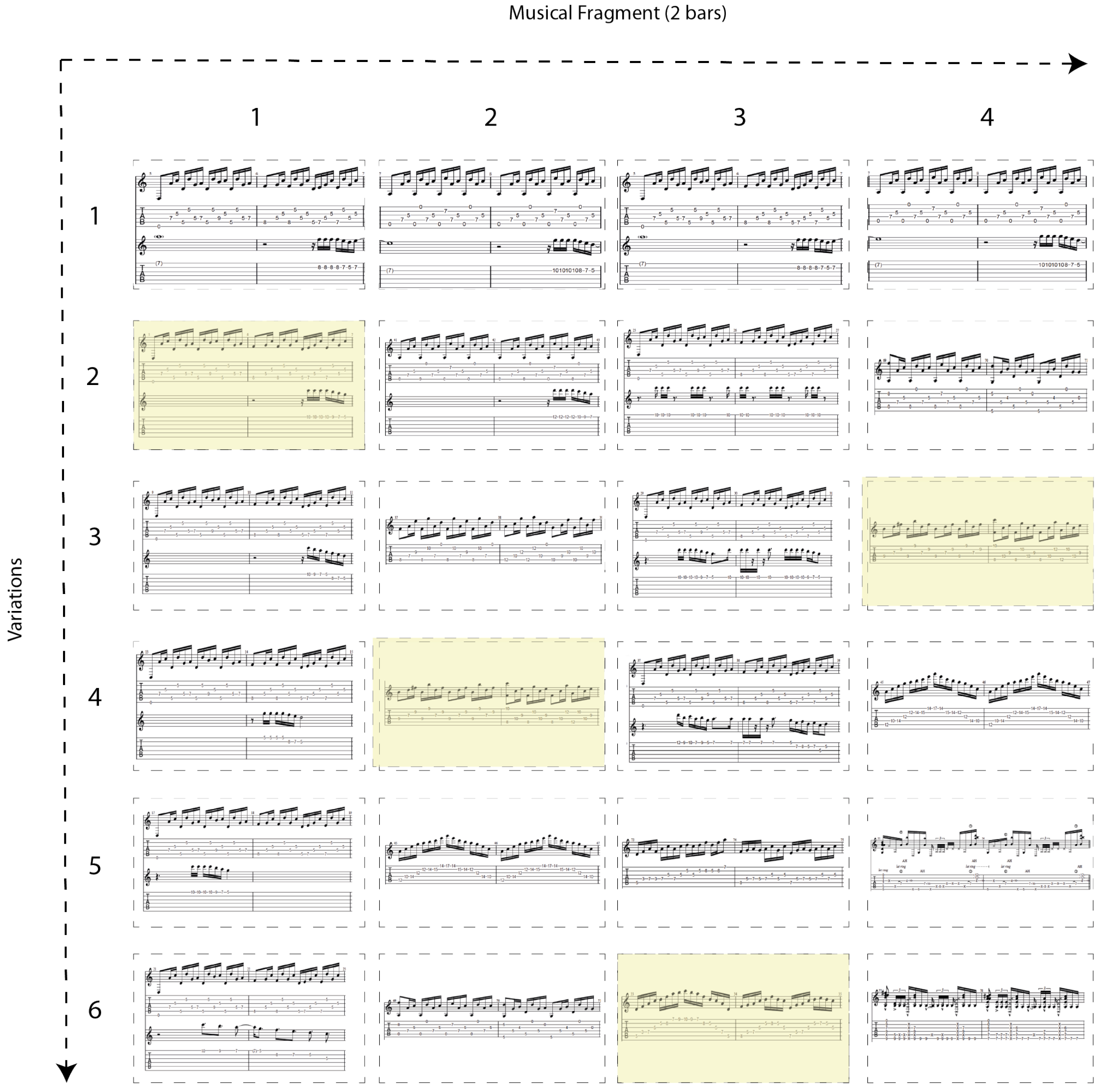

Musical Fragment (2 bars)
1
2
3
4
Variations
1
2
3
4
5
6

Figure 4.20 Musical dice games matrix: iteration 1

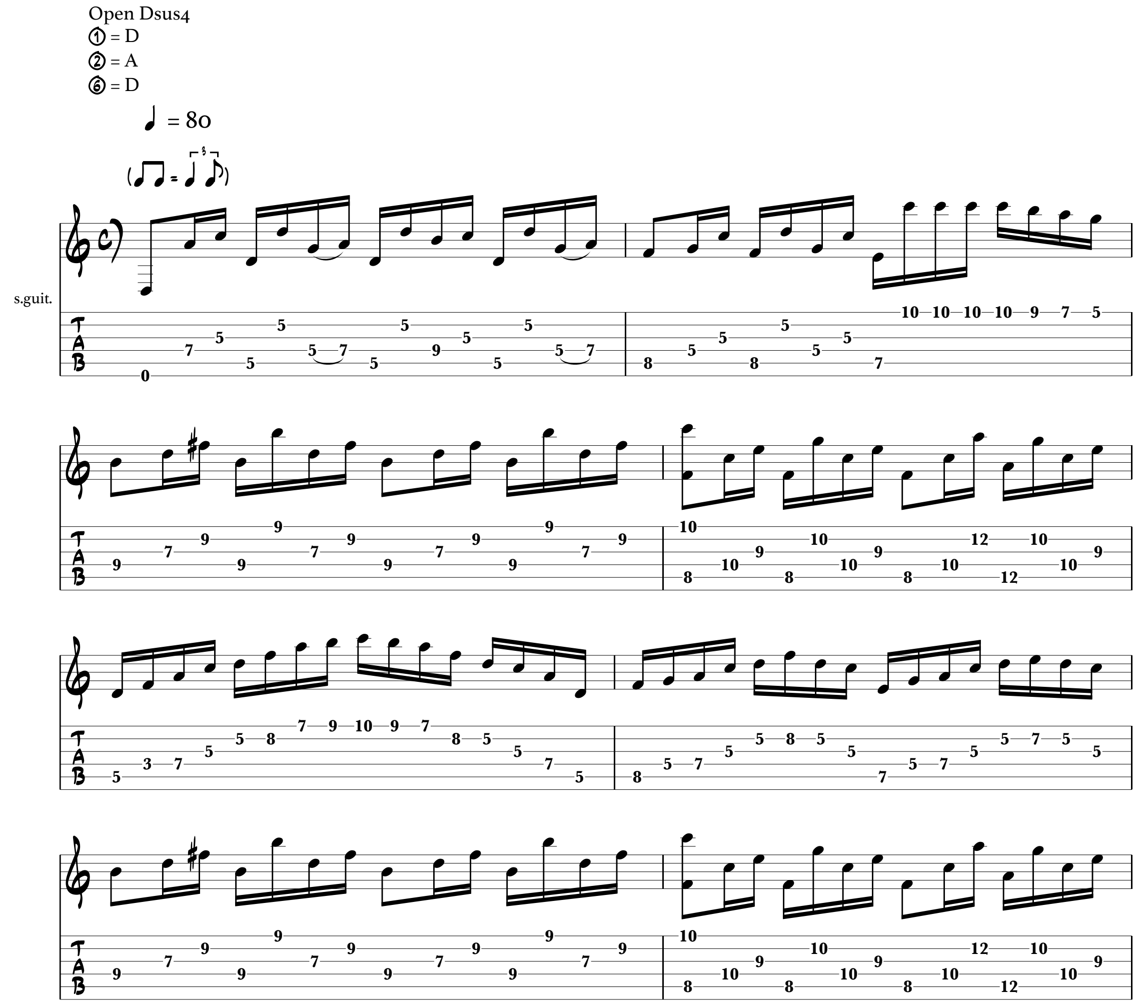

Open Dsus4
① = D
② = A
⑥ = D
♩ = 80
s.guit.
T
A
B

Figure 4.21 Musical dice games transcription: iteration 1

Audio (B) 4.10 MDG iteration 1

Note: some minor adjustments must be made to accommodate transitions between one fragment to the next (as can be heard in the audio).

4.6 SUMMARY OF METHODOLOGICAL APPROACHES.

The above material comprised a four-part hybridised methodology with the aim of generating new vocabulary and developing improvisational skills. **Part 1** developed strategies for improvisation practice termed *teleological practice* and *autotelic practice* based on the psychological literature explored in the *Literature Review* chapter. **Part 2** demonstrated the process of teleological practice based on Berkowitz' model for acquiring improvisatory skill. It chronicles the development of new vocabulary as well as the implementation of practice concepts. Because of the emphasis on harmonic and melodic development in part 2, **part 3** focuses on expanding the rhythmic palette by mapping *Konnakol* phrases onto percussive guitar techniques. Finally **part 4**, demonstrates the process of *musical dice games* and gives an example of the *musical dice games matrix*.

5 ANALYSIS AND COMMENTARY

5.1 OVERVIEW OF CONTENTS

- **Teleological Practice Review**
- **Autotelic Practice Review**
- **Aspect Analysis: Developing an Analytical Approach**
- **Analysis of New Vocabulary and Improvisation Approaches**
    - Musical Dice Games
    - Harp Harmonic Technique
    - Alap Approach
    - Linear Approaches
    - Tripartite Approach
    - Implied Polyphony and Towner's Spotlight Panning Concept
    - Harmonic Concepts in DADGAD
- **Case Study Analysis: Solo Guitar Improvisations**
    - DADF#AE Improvisation
    - DADGAD Improvisation II

The purpose of this analysis and commentary is to systematically demonstrate the explicit processes and materials generated as a result of this research project, as well as uncover and articulate the *implicit* processes and materials generated. It is used both as a guide or exegesis to the portfolio contents, and for the researcher's own reflective practice in order to identify limitations, insights and areas of further study.

The analysis demonstrates the efficacy of the methodological approaches formulated in the previous chapter, articulating original developments in vocabulary and approaches. As a consequence, some of the material has also been presented in the methodology chapter. However, wherein the focus of the methodology was the formulation of methods and processes used to develop vocabulary, the focus herein is the developments themselves.

The main analyses are supplemented with auxiliary sections providing context and commentary. This includes a review of the teleological and autotelic practice methodologies as well as the development of a unique analytical approach based on Pressing's notion of redundancy (Pressing, 1987).

5.2 TELEOLOGICAL PRACTICE REVIEW

The following section presents analyses and commentary on a selection of portfolio materials under the category of teleological practice. Teleological practice is phase one of a biphasic approach to improvisation practice developed in the methodology chapter. Largely a system 2[14] approach, teleological practice directs attention at pre-formulated goals and is inherently effortful. Its goal is to establish long-term memory stores in the form of musical ideas ('specialist knowledge' in Pressing's terms) and develop associated motor skills by turning those ideas into deployable devices ('knowledge base').

The practice methodology laid out in the previous chapter is as follows:

- Conception of modular vocabulary component
- Rote learning of MVCs, their transpositions and variations.
- Practicing of aspects (dynamics, timbre, articulation, expressiveness etc.)
- Practicing recombination principles by concatenating MVCs using etudes and musical dice games
- Automatization of MVCs and their concatenations.
- Practicing improvisational models, paying special attention to the improvisatory devices used and their development.

The biphasic approach was structured using Ericsson's notion of deliberate practice (1993) and Csikszentmihalyi's concept of flow (1975). The nine dimensions of flow as outlined by

---

[14] System 2: the explicit, conscious, effortful cognitive system associated with deliberate concentration, self-control, mental arithmetic, etc. For an in-depth discussion of system 1 and 2, see Kahneman's (2011) *Thinking Fast and Slow.*

Csikszentmihalyi (2002) were used as the framework for the isolation of the two phases. Although Ericsson has declared there to be a dichotomous relationship between flow and deliberate practice, it was observed that the characteristics (or *dimensions*) of deliberate practice almost exactly align with four flow dimensions: (1) challenge-skill balance, (2) clear goals, (3) proximal feedback and (4) concentration on the task at hand. However, some of these dimensions, indeed, appear to be at odds with other flow dimensions - for example, *clear goals* and *autotelic experience* do not easily reconcile.

Posner et al. (2010) observed a similar paradox in meditation practice in which concentration (effortful) and mindfulness (effortless) are often key aspects of the process. They posited a *tri-phasic* model moving gradually from an initial explicit, effortful phase towards an implicit effortless phase. Therefore an analogous model was constructed for the flow experience using the nine dimensions split across two phases. Fig 5.1 is presented again to reiterate this point:

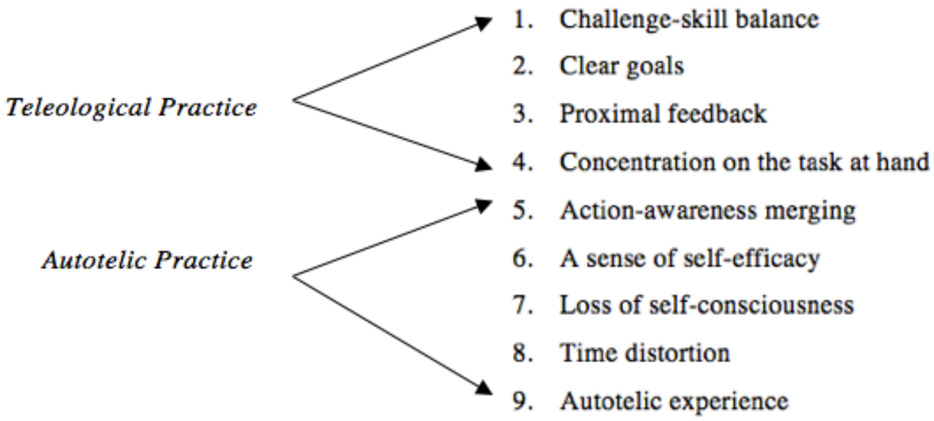

Teleological Practice
Autotelic Practice
1. Challenge-skill balance
2. Clear goals
3. Proximal feedback
4. Concentration on the task at hand
5. Action-awareness merging
6. A sense of self-efficacy
7. Loss of self-consciousness
8. Time distortion
9. Autotelic experience

Figure 5.1 Teleological and autotelic practice with corresponding flow dimensions

It should be noted that the biphasic approach is cyclical rather than linear. For example, the first step in the teleological practice methodology above "conception of modular vocabulary component" was often achieved through 'free' improvisation and more '*autotelic*' creative explorations. Similarly, material generated through autotelic practice was often fed back into the teleological methodology.

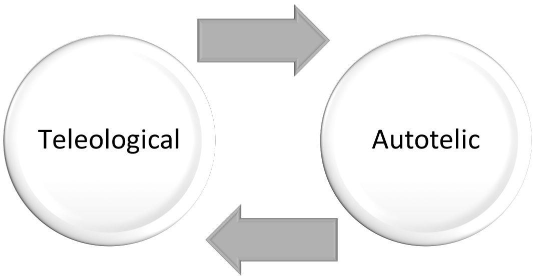

Teleological
Autotelic

Figure 5.2 Cyclical nature of teleological and autotelic practice

5.3 AUTOTELIC PRACTICE REVIEW

The term autotelic practice was derived from Csikszentmihalyi's notion of autotelic experience in which an activity is engaged in for no external purpose. The activity is an end in itself and is not done for some future reward or benefit (Csikszentmihalyi, 2002, p.67). Autotelic practice, by extension, is a practice that is engaged in for no reason outside of itself. There may seem to be a paradox between the terms *autotelic* and *practice*, in that practise is typically an activity carried out in order to develop some aspect of playing (i.e. a future benefit). However, it is often the case that when one lets go of a self-centred ego-driven desire to develop and engages in their activity with purposelessness - with no ulterior motive other than to enjoy the process - that a truer form of expression can take place. This is embodied in the following quote from Kenny Werner:

> There is no fear, because he is not attached to the results of actions. Practice takes no patience, since there is no burning need to reach a goal. There is simply the celebration of the doing, the learning, the achieving and the enjoying. (Werner, 1996, p.78)

One of the primary characteristics of the autotelic experience is a reduction in the subjective effort felt by the practitioner. Normal action conditions usually require increases in effort for corresponding increases in performance efficacy. In autotelic (or flow) conditions subjective effort decreases and performance efficacy is maintained or increased.

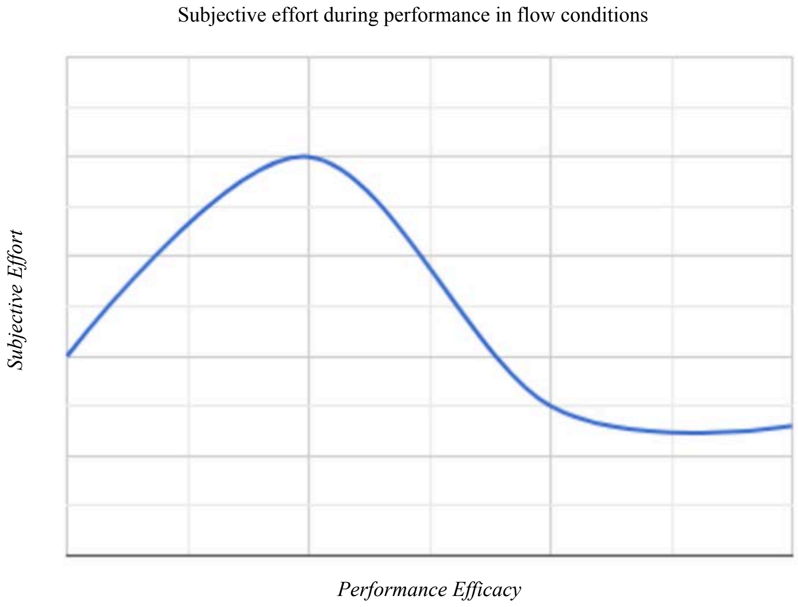


Figure 5.3 Subjective effort during performance in flow conditions

This effortlessness may be a function of what Dietrich (2004) terms *transient hypofrontality:* a temporary lack of activity in the dorsolateral prefrontal cortex, responsible for abstract thinking, planning and self-reflection. It seems there is a shift from system 2 cognitive processing to system 1, capable of much greater parallel processing power (Järvilehto, 2016, p.96). System 2 thinking may inhibit the flow of system 1, however, there is some evidence for the utility of system 2 in initiating actions that eventually lead to a system 1 takeover. For example, Posner et al. (2010) suggest three stages of meditation moving progressively from conscious volitional control (system 2) to effortless implicit control (system 1). Indeed the utility of system 2 to induce system 1 *transient hypofrontality* was observed by Dietrich:

> […] volitional control over the executive attentional system can be used to narrow the focus of attention to exclusively buffer the task at hand, eliminating other

> phenomenological features computed by the explicit system to enter consciousness. (Dietrich, 2004, p.758).

In my own practice, meditation was a tool often used to assist in system 1 transient hypofrontality (or flow induction). I would set up my instrument and recording equipment to be easily accessed after the meditation session. I would begin by explicitly directing attention towards neutrally observing my breath to “exclusively buffer the task at hand.” After a period of time (usually 15-30 minutes) there was often a natural transition to a more open, relaxed feeling of effortless attention. At any point during this latter phase, I would pick up my instrument and attempt to maintain a sense of effortless diffuse attention. It was important for me not to have a rigid protocol but to engage in whatever I felt was natural. Sometimes I would follow Werner’s (1996) advice to engage in free improvisation, ‘[practicing] flying without worrying about flight patterns’ (p.145), and then to play only what I have already mastered. However, at other times it felt much more natural just to begin recording an improvisation. If, at points, I felt overly analytical or self-conscious, I would consciously direct attention towards neutrally observing bodily movements or the sounds produced, without judgement. The aim was to use any system 2 processing power to exclusively buffer the task at hand, leaving little room for analytical thinking, critical reflection or self-consciousness.

Some attention was also allocated to musical dimensions, however they were usually limited to information about referents. Conceptual thinking about chord-scale relationships, modular vocabulary components and recombination principles as well as technical thinking were largely abandoned. Instead, system 2 processing could be engaged to switch between stylistic models (e.g. from a linear approach to a tripartite approach). This pre-planning acted as a safety net, removing anxieties and limiting prolonged tedious sections within improvisations.

The vocabulary contained within these improvisations is largely a result of the internalisation of the teleological methodology. The material generated therein was done so in order to assimilate new vocabulary and approaches into my playing in a way that is natural and effortless. However, it should be noted that improvisations tended to make use of material that had been extensively practiced in the preceding weeks. Material that had not been deliberately practiced in the preceding weeks often didn't arise during improvisations, or did so in more rudimentary forms. This is most likely due to the extent of time allocated to practice.[15]

A 1993 study of people learning to read Braille, used transcranial magnetic stimulation (TMS) to map their brains in development.[16] They were mapped on Fridays (at the end of the week's training) and Mondays (at the beginning of a new week). Friday maps showed "very rapid and dramatic expansion, but by Monday […] had returned to their baseline size" (Doidge, 2007, p.199). Monday maps "didn't begin to change until six months into the training; then they increased slowly and plateaued at ten months." (p.199). The researcher, Pascual-Leone, suggested that Friday changes represent a strengthening in existing neuronal pathways, while the Monday changes represent the "formation of *brand-new* structures" (p.199).

McKnight (2012) and Williams (2017) estimated a period of around three months for assimilation of devices into vocabulary, however, my experience has been closer to those in the Braille reading experiment. While devices could be 'crammed' in the weeks preceding an improvisation, they were often lost within days or weeks if extensive practice was not continued. Devices that became part of a continued, *moderate* practice regime, on the other hand, gradually became easier and easier to access in live contexts without extensive preplanning. Therefore in future, if the goal is long-term assimilation, I would suggest a period of around six to ten months for projects that include the assimilation of new and unfamiliar concepts and techniques.

---

[15] This amount of time varied as the biphasic approach is cyclical rather than linear. However, it was estimated that the average time between conception of a device and the autotelic recordings was approximately three months.

[16] The study referred to is Pascual-Leone A. and Torres, F. (1993): 'Plasticity of the sensorimotor cortex representation of the reading finger in Braille readers', in Doidge (2007), *The Brain that Changes Itself* (pp. 198-199)

5.4 ASPECT ANALYSIS: DEVELOPING AN ANALYTICAL APPROACH

Analysis of improvised music and novel vocabulary is a thorny endeavour. Improvised music for example, tends not to conform to the mathematical divisions found in western notation, such as exact pitch class and metric placement. Furthermore, the portfolio materials presented herein express a dynamic relationship between the techniques of contemporary fingerstyle guitar, the harmonic vocabulary of guitarists such as Ralph Towner and various improvisational strategies devised in the methodology chapter (e.g. musical dice games). In other words, a singular analytical methodology is not sufficient to provide a comprehensive analysis. Therefore a unique analytical approach must be formulated in order to understand and articulate this dynamic relationship.

The framework for the following analytical approach draws on Pressing's notion of *redundancy* in which "materials […] are known in intimate detail, and from differing perspectives, and the various materials or modules are cross-linked by connections at various levels of the hierarchical knowledge structure" (Pressing, 1998, p.53). In other words, musical materials can be encoded from multiple perspectives, for example as an *object* (Dm9 chord) a *feature* (diatonic), a process (arpeggiated figure) etc. The more perspectives that are encoded and the stronger the links between each perspective, the more redundancy of cognitive processing structures available to the improviser. Pressing divides these perspectives into three categories which he terms 'aspects': (1) musical, (2) acoustic and (3) movement (or physical). These aspects are particularly salient to the researcher's own practice where there is often emphasis on texture, timbre (acoustic properties), extended techniques of a physical nature (movement properties) as well as conventional pitch-harmony relationships (musical properties). As a consequence, these 'aspects of cognitive redundancy' - originally applied to the cognitive processes of the emerging improviser – have been reverse engineered as tools for analysis.

Any aspect may be given primacy in a given analysis depending on its salience. For example, an analysis of music laden with extended techniques may privilege the aspect 'physical', and give peripheral treatment to the 'musical' aspect or vice versa.

- Musical aspects include harmony, melody, rhythm.
- Acoustic aspects include timbre, texture, dynamics, use of electronic effects.
- Physical aspects include chord/scale shapes, techniques (e.g. HHT), movement patterns (e.g. chromatic transposition, constant structure movements and symmetrical patterns).

Of course these aspects are *interdependent* and no musical material will be solely 'physical' or 'acoustic' but rather emphasis may be given to certain aspects in order to highlight salient features.

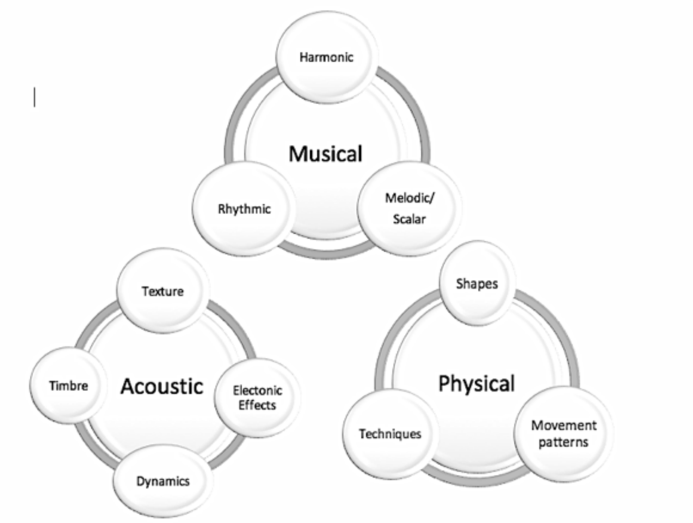

Harmonic
Musical
Rhythmic
Melodic/ Scalar
Texture
Acoustic
Timbre
Electonic Effects
Dynamics
Shapes
Physical
Techniques
Movement patterns

Figure 5.4 Development of Pressing's 'aspects' for use in analysis

Pressing's aspects are useful building blocks, yet areas of opacity remain when used as analytical tools in this context. For example, the portfolio materials include solo improvisations, some of which are structurally-led – an aspect rarely engaged in traditional jazz improvisation. A useful resource in this area was Peter Elsdon's paper entitled *Style and the Improvised in Keith Jarrett's Solo Concerts* (2008) in which Jarrett's solos are deconstructed as comprising various 'stylistic models'(p.52) including categories such as free counterpoint, extended techniques (p.54) Folk ballad (p.59) and Blues vamp style (p.61). Such analysis is vital to Jarrett's solo improvisations as the 'architecture' he creates is clearly more salient than any specific pitch-harmony relationship, phrasing or technique. Given the nature of some of the materials in this portfolio, this method of analysis is indispensable and was therefore assimilated with the previous three. Structural aspects include micro-analysis (concatenation of devices); meso-analysis (unfolding of a given stylistic model) and macro-analysis (the architecture of combined stylistic models).

Finally, it was decided that one more aspect should be included in the analytical toolkit: a *conceptual* aspect. This includes conceptual influences (such as literary or mythological themes); the affect or mood of a piece or section; dialogical aspects such as motivic allusions and imitative devices; and broader aesthetic properties which do not conform to any of the other four categories.

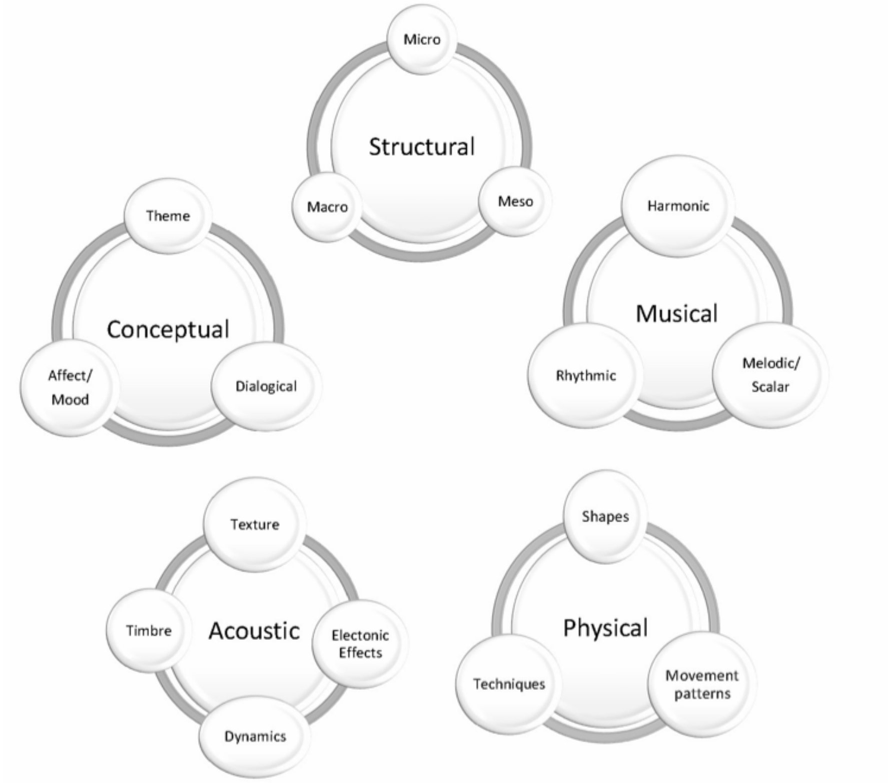

Micro
Structural
Macro
Meso
Theme
Conceptual
Affect/ Mood
Dialogical
Harmonic
Musical
Rhythmic
Melodic/ Scalar
Texture
Timbre
Acoustic
Electonic Effects
Dynamics
Shapes
Physical
Techniques
Movement patterns

Figure 5.5 Framework for 'aspect analysis'

5.5 ANALYSIS OF NEW VOCABULARY AND IMPROVISATIONAL APPROACHES

5.5.1 Musical Dice Games Analysis

Musical dice games refers to a common eighteenth century practice which provided a 'matrix of musical choices' for each bar, with a number given to each possibility. The player would roll the dice and 'compose' a piece bar by bar. (Berkowitz, 2010, p.65). The idea of musical dice games to practice combining modular vocabulary components in various concatenations. The MVCs are to be practiced and overlearned, but each iteration of the musical dice games should only be practiced once. Each iteration should surprise the practitioner to some degree, forcing real-time adaptation to new stimulus.

The following example was derived from a free improvisation, done without any prior planning or deliberate knowledge base development. However, there was an *implicit referent* in the form of the music of Toumani Diabaté, which I had been listening to in the days leading up to recording. Indeed, it is characterised by fairly rudimentary attempts at imitating the idiomatic characteristics of Diabaté's music. The example below was identified as being a useable MVC and extracted for the application of the teleological practice methodology.

Tuning: DADGAD

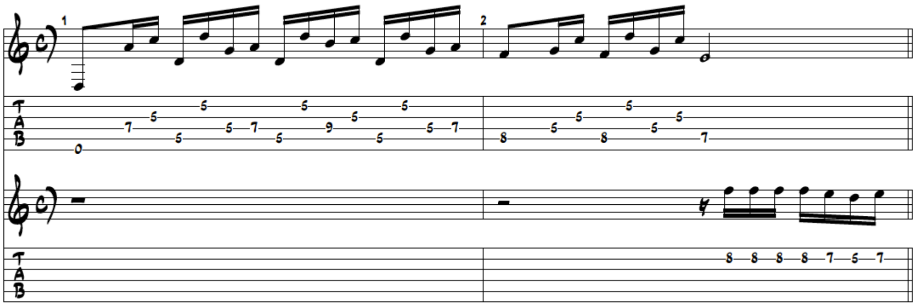


Figure 5.6 Diabaté-style MVC ex.1

Audio (B) 5.1 Diabaté-style MVC ex.1

Musical >	Rhythmic >	Swung semi-quavers
Musical >	Harmonic >	Dorian mode
Acoustic >	Timbre >	Use of open strings
Conceptual >	Dialogical >	Idiomatic allusions to Malian kora music
Structural >	Micro >	Repetitive motives

Figure 5.7 Analysis of previous figure

Tuning: DADGAD

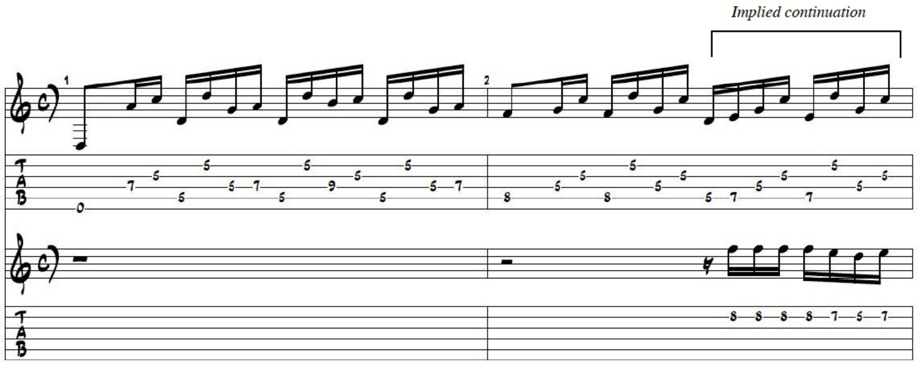


Figure 5.8 Diabaté-style MVC ex.1b

Acoustic >	Textural >	Homophonic; a degree of implied polyphony. The main motive represents something akin to a riff rather than a broken chord. Although it doesn't continue underneath the melody, the intended effect is that it recedes to the background, giving way to the melody in the foreground: its presence is implied.

Figure 5.9 Analysis of previous figure

Tuning: DADGAD

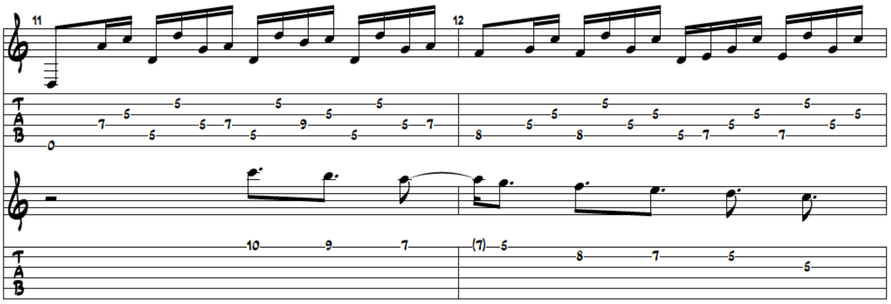
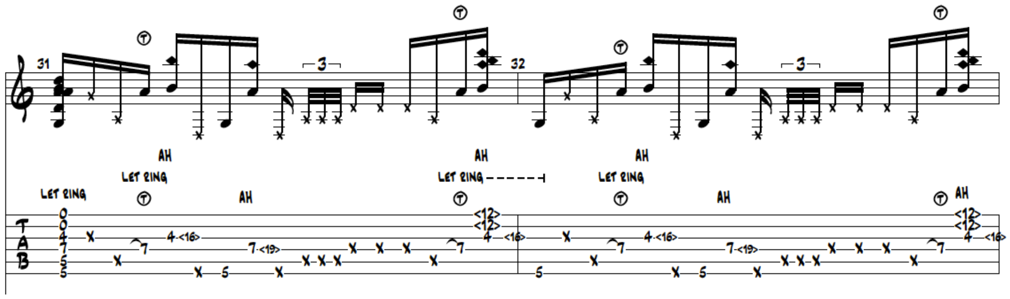


Figure 5.10 Diabaté-style MVC variation 1

Audio (B) 5.2 Diabaté-style MVC variation 1

Musical >	Rhythmic >	Rhythmic stretching of melodic line; syncopation.
Acoustic >	Textural >	Polyphonic
Physical >	Technique >	Significant practice required to establish new motor patterns
Conceptual >	Dialogical >	Polyphonic texture allusive to Malian kora music in which ostinato patterns and improvised melodic runs are played simultaneously.

Figure 5.11 Analysis of previous figure



Tuning: DADGAD

Figure 5.12 Diabaté-style MVC further variation

Audio (B) 5.3 Diabaté-style further variation

Acoustic >	Textural >	Implied polyphony; tripartite structure: bass, percussion, melody
Physical >	Technique >	Use of extended techniques: artificial harmonics, slap harmonics, body percussion. Use of Konnakol vocabulary
Conceptual >	Aesthetic Descriptor >	Expansive

Figure 5.13 Analysis of previous figure

5.5.1.1 Musical Dice Games Matrix

Once enough variations were formulated, the musical dice games matrix was created. Four MVCs are strung together but each MVC (now referred to as a 'musical fragment') has six possible variations. Each pathway through the matrix is referred to as an iteration. A multitude of iterations were practiced, four of which were recorded. However for the purposes of this thesis only one will be analysed. The remaining three iterations can be found in *Volume II: Transcription Portfolio.*

Musical dice games matrix: iteration 4

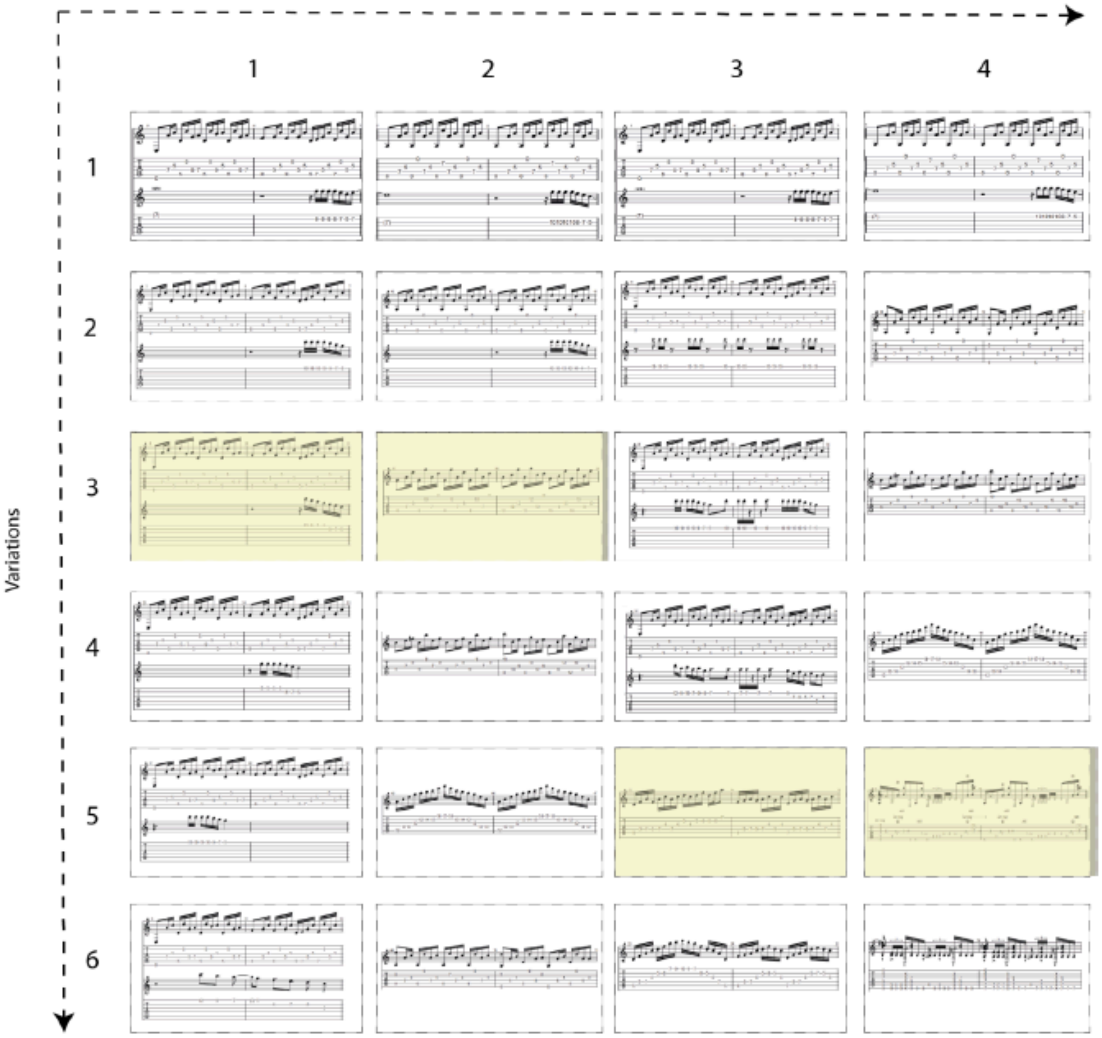

1
2
3
4
Variations
1
2
3
4
5
6

Figure 5.14 Musical dice games matrix iteration 4

Tuning: DADGAD

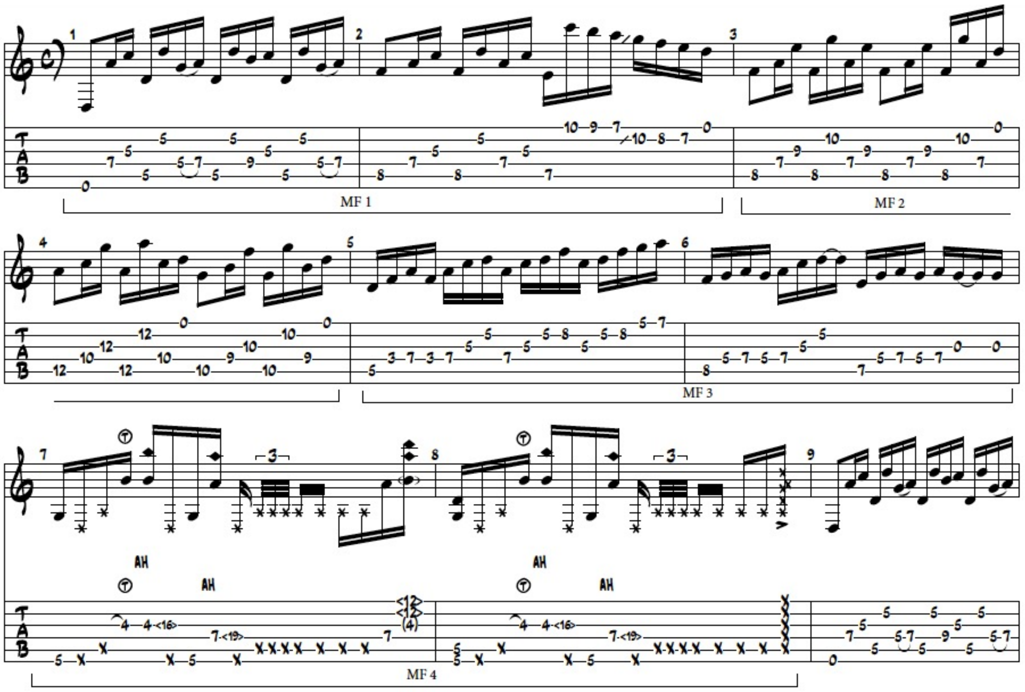

MF 1
MF 2
MF 3
MF 4
AH
AH

Figure 5.15 Musical dice games transcription iteration 4

Audio (B) 5.4 MDG iteration 4

Aspect	Sub-Aspect	MF 1	MF 2	MF 3	MF 4
Physical >	Technique >	Conventional fingerpicking technique using P, I, M	Conventional fingerpicking technique using P, I, M	Linear picking technique using I, M	Extended techniques: slap harmonics and body percussion
Acoustic >	Texture >	Homophonic	Homophonic	Monophonic	Implied Polyphony
Musical >	Harmonic >	Dm7(13), F(13), E	Fmaj9, Am7(11), G7	Dm7, F(9,13), Em(11)	G(9)

Figure 5.16 Analysis of previous figure

Although there are disparate techniques and textures used, the iteration retains a degree of continuity in that all chords relate to D Dorian.

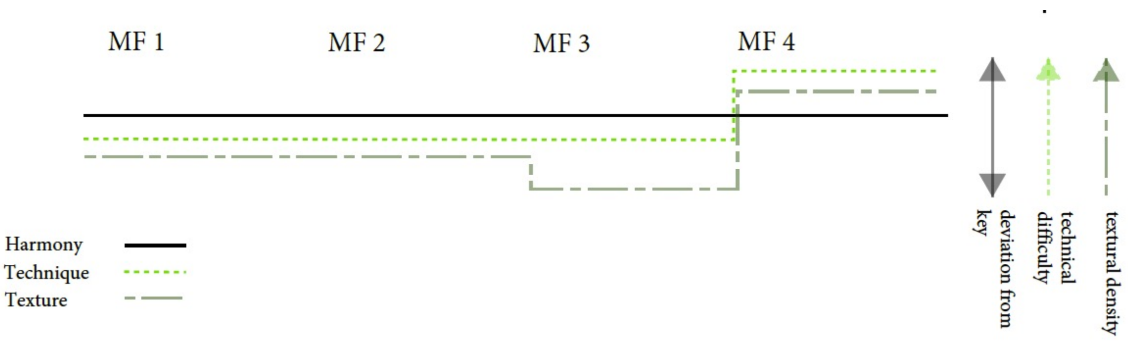


Figure 5.17 Graphic depiction of iteration as relates to harmony, technique and texture

5.5.2 Harp Harmonic Technique Analysis

The harp harmonic technique (HHT) was used extensively throughout the material presented in this thesis. It was a cornerstone technique because it allows for fluid execution of arpeggios and scalar runs with minimal left hand movement. The following examples demonstrate the trajectory of the HHT through various contexts including MVCs, etudes and improvisational models.

Tuning: DADGAD

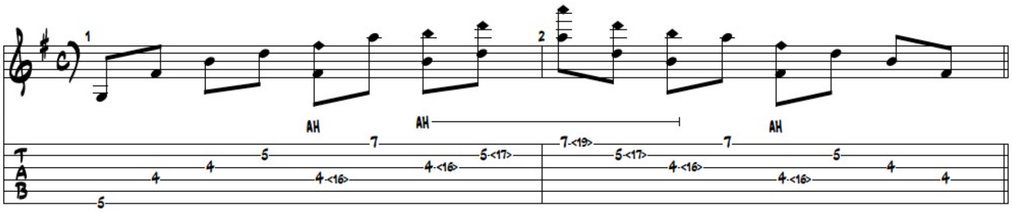


Figure 5.18 HHT MVC 1

Audio (B) 5.5 HHT MVC 1

Musical >	Harmonic >	Gmaj9; arpeggiated figure
Physical >	Technique >	HHT; RH is both note generator and harmonic node selector
Acoustic >	Texture >	sustained, delicate, wide pitch range
Conceptual >	Aesthetic Descriptor >	dream-like, ethereal

Figure 5.19 Analysis of previous figure

Tuning: DADGAD

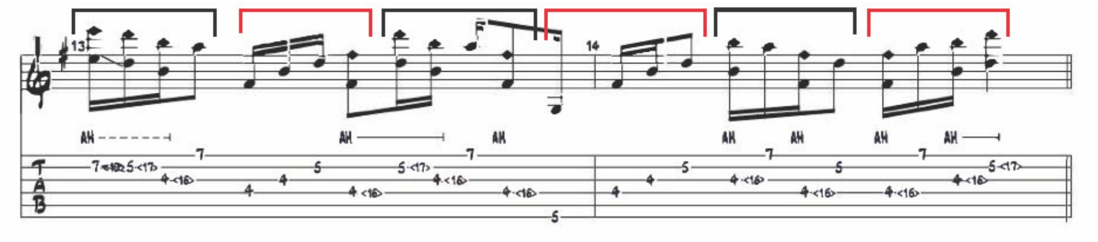


Figure 5.20 HHT MVC 2 rhythmic modularisation

Audio (B) 5.6 HHT MVC 2

This variation was produced by further modularising the MVC into groups of four notes. The rhythmic groupings could have more easily been transcribed in 5/16, however the idea was to accommodate the improviser in superimposing the rhythm over 4/4 in order that this MVC be available in many contexts.

Conceptual >	Mathematical >	black brackets: descending groups of four, each group beginning on the next descending chord tone. Red brackets: interpolation of ascending groups between descending groups.
Musical >	Rhythmic >	5/16 superimposed over 4/4

Figure 5.21 Analysis of previous figure

Tuning: DADGAD

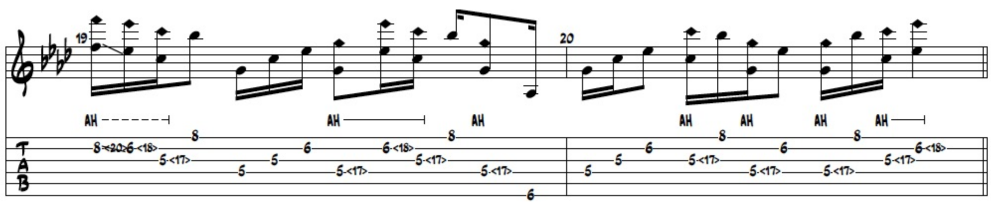


Figure 5.22 HHT MVC 2 chromatic transposition

Audio (B) 5.7 HHT MVC 2 chromatic transposition

Musical >	Harmonic >	Abmaj9; intervallic structure maintained.
Physical >	Movement >	LH shifts up one fret. RH shifts up corresponding harmonic node points (approx. 1 fret).

Figure 5.23 Analysis of previous figure

Tuning: DADGAD

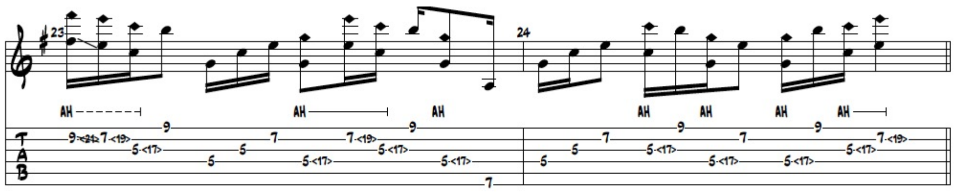


Figure 5.24 HHT MVC 2 diatonic transposition

Audio (B) 5.8 HHT MVC 2 diatonic transposition

Musical >	Harmonic >	Am9, intervallic structure adapted, chord ii in relation to original MVC.
Physical >	Shape >	same relative shape, though widening of finger positions across five frets.

Figure 5.25 Analysis of previous figure

Tuning: DADGAD

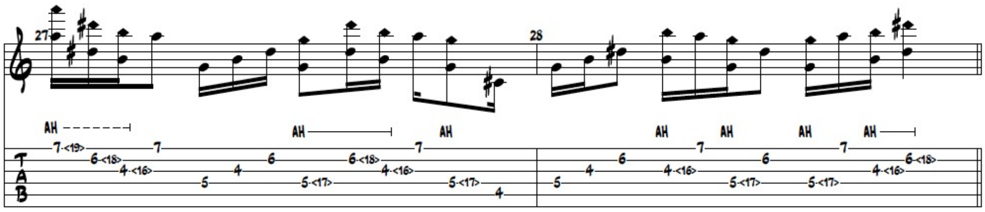


Figure 5.26 HHT MVC 2 modal transposition: whole-tone sound

Audio (B) 5.9 HHT MVC 2 modal transposition

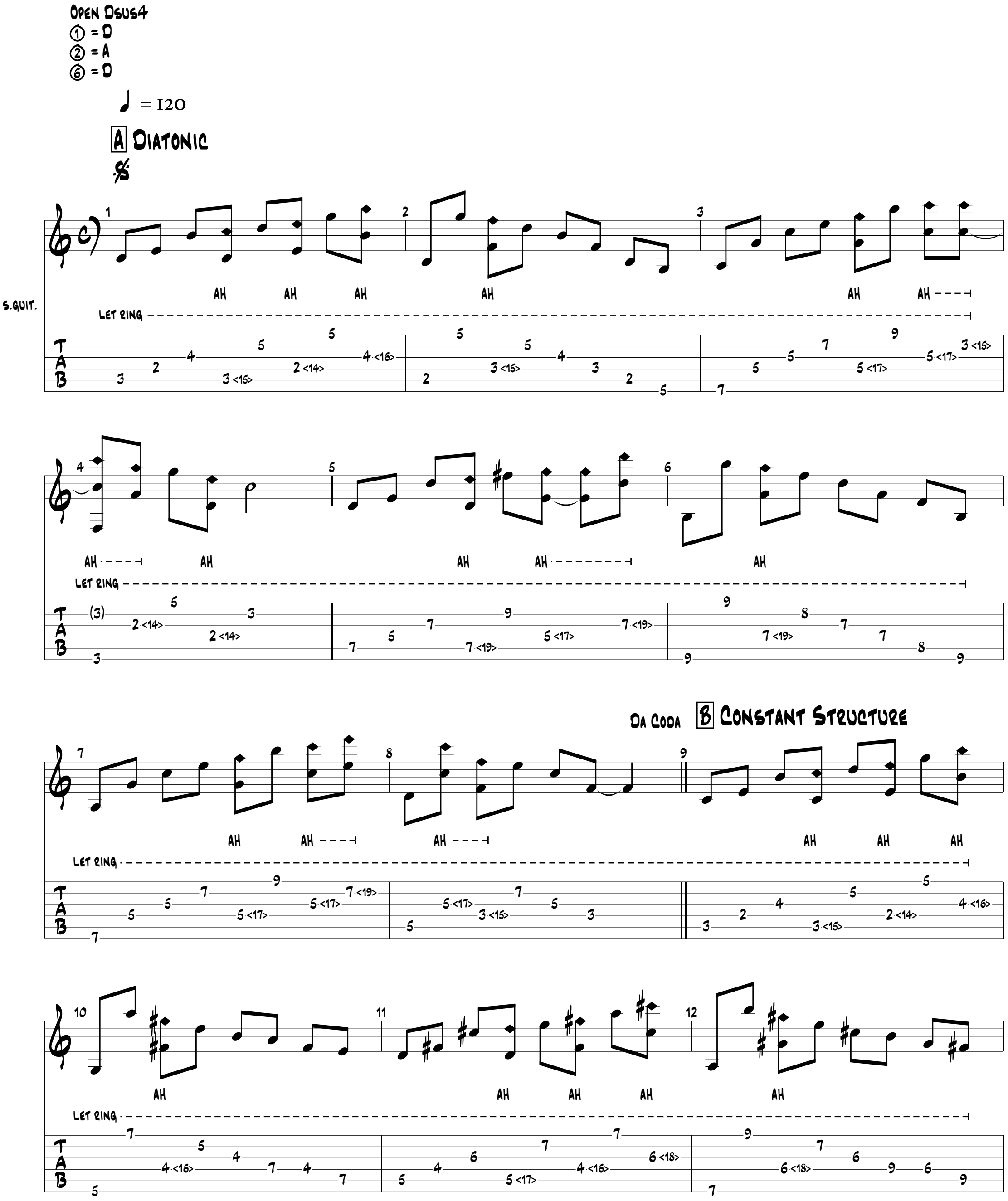
Musical >	Melodic/Scalar >	Hexatonic: implied whole-tone; intervallic structure C#, D#, (no F), G, B, A
Conceptual >	Aesthetic Descriptor >	Otherworldliness

Figure 5.27 Analysis of previous figure

5.5.2.1 HHT Applied to Harmonic Concepts

Several etudes were constructed in order expand the utility of the HHT for use in various harmonic contexts. The wide pitch range and limited left-hand movement makes it ideal for realising chord progressions through arpeggiations. The following example (fig. 5.28) is essentially a technical etude, rather than an improvisatory etude, in that the primary goal is to develop technique and not to practice improvisatory strategies. However, more than merely practicing motor skills, it establishes cognitive networks between conceptual harmonic vocabulary and the motor skills required to fulfil the technique, thereby practicing an accessory improvisatory skill. As a consequence the improviser learns to move fluidly between chords and realise harmonic progressions using the HHT. Once a reasonable degree of knowledge compilation occurs through continued practice, the material becomes flexible and automatic enough to be used in improvisations.

Etude 1


Open Dsus4
① = D
② = A
⑥ = D
♩ = 120
A Diatonic
S.Guit.
AH
Let ring
Da Coda
B Constant Structure

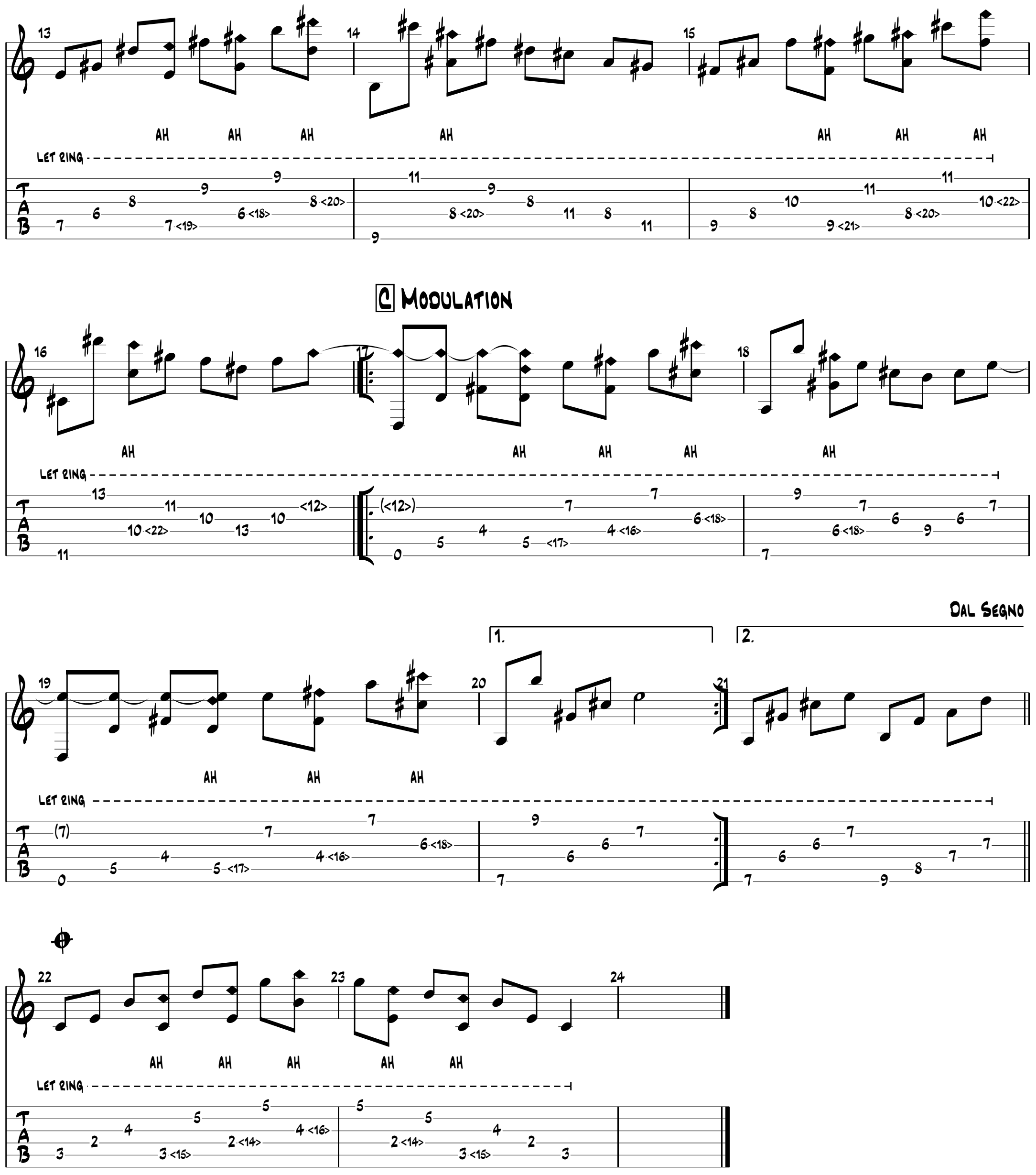
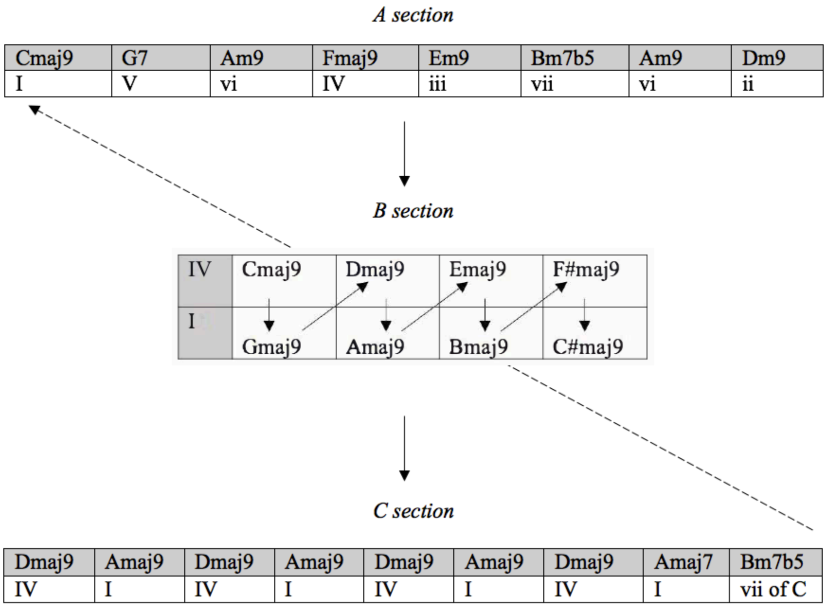

C
Modulation
AH
Let ring
Dal Segno
1.
2.

Figure 5.28 Etude 1 full example

Audio (B) 5.10 Etude 1

Structural >	Macro >	(A) Diatonic progression in C major, (B) contiguous IV-I pattern using constant structures, (C) chromatic modulation to D major, (A) diatonic progression in C major.
Structural >	Meso >	See diagram below:

Figure 5.29 Analysis of previous figure



A section

Cmaj9	G7	Am9	Fmaj9	Em9	Bm7b5	Am9	Dm9
I	V	vi	IV	iii	vii	vi	ii

B section

IV	Cmaj9	Dmaj9	Emaj9	F#maj9
I	Gmaj9	Amaj9	Bmaj9	C#maj9

C section

Dmaj9	Amaj9	Dmaj9	Amaj9	Dmaj9	Amaj9	Dmaj9	Amaj7	Bm7b5
IV	I	IV	I	IV	I	IV	I	vii of C

Figure 5.30 Harmonic structure of etude 1

Tuning: DADGAD

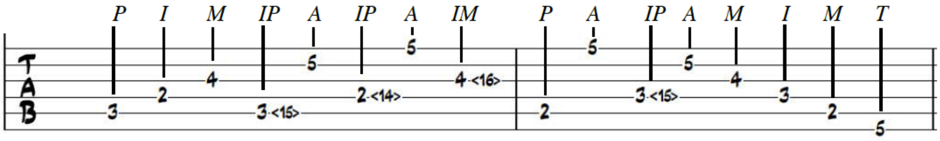


Figure 5.31 Example of RH fingering for execution of a Cmaj9 arpeggio using HHT

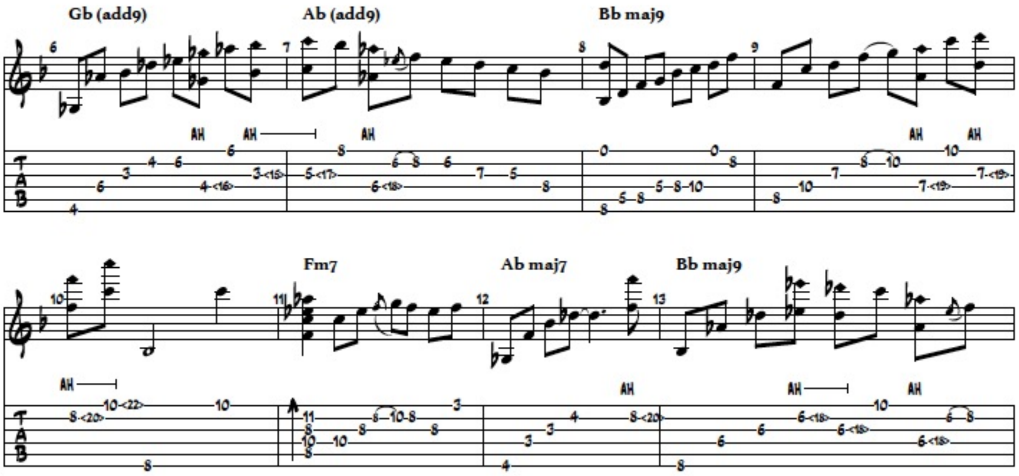
Physical >	Technical >	LH assumes static chord position. RH arpeggiates chord with HHT. Fingering is devised so that no digit plays two sequential notes, in order that a degree of speed and fluidity can be achieved. Conventional PIMA notation is used. Where artificial harmonics are concerned two RH fingers are required and notated as such. The former letter references the finger touching the harmonic node point and the latter references the picking finger.

Figure 5.32 Analysis of previous figure

5.5.2.2 Harmonic Realisation of an Improvisational Model using HHT

The following is an excerpt from a solo guitar arrangement of *A Lotus on Irish Streams* by Mahavishnu Orchestra, originally for guitar, violin and piano. Two audio examples are presented. One is a home recording and the other is a live recording at a Belfast Guitar Night in the Crescent Arts Centre. The transcription applies to the home recorded version.

This piece was chosen as an exemplar for future improvisations as it assimilates a wide variety of techniques and concepts of particular interest to the researcher. Paramount is the use of legato flourishes which presents challenges on the guitar given the limitations of the instrument. For the most part the arrangement holds true to the harmony and melody though some liberties are taken with regards to flourishes and rhythmic elasticity. The HHT allows for wide pitch ranges to be executed with little left hand movement. In other words, it allows for the guitar to imitate some of the material originally played on piano (scalar flourishes, arpeggios etc.).



Tuning: DADGAD

Figure 5.33 Harmonic realisation of improvisational model using HHT

Audio (B) 5.11 A Lotus on Irish Streams (0:13-0:34)

Conceptual >	Dialogical >	HHT used to achieve legato flourishes originally played on piano.
Musical >	Harmony >	HHT articulates the unfolding harmonic progression. E.g. in bars 6-9 the HHT articulates a Gb(9), Ab (9) and Bbmaj9.
Physical >	Movement >	HHT allows for wide pitch range with little LH movement.

Figure 5.34 Analysis of previous figure

Further example:

Audio (B) 5.12 A Lotus on Irish Streams (Live at Belfast Guitar Night)

5.5.3 Alap Approach Analysis

The following is an approach based on the concept of *alap* in North Indian classical music; "the unmetred, literally 'unbound' section of a performance, is the movement in which the performer is free to explore the intricacies of a melodic structure without the constraint of *tal* or lexical text" (Clayton, 2000, p.95). The idea was to use the tuning – DADF#AE – as the referent for the improvisation, exploring textures in the form of open strings, harmonics and sympathetic resonances. The use of a drone and the exploitation of the sympathetic resonances of the instrument can be seen as an attempt to mimic some of the qualities of the sitar - concert sitars have thirteen sympathetic strings that run underneath the playing strings. As the focus was textural, there is minimal development in melodic content. The harp technique (or 'campanella') is used for any scalar runs to maximise resonance. Pitches particularly effective in creating sympathetic resonances were often repeated in succession as is clear in bar 7 of the example below.

Tuning: DADF#AE

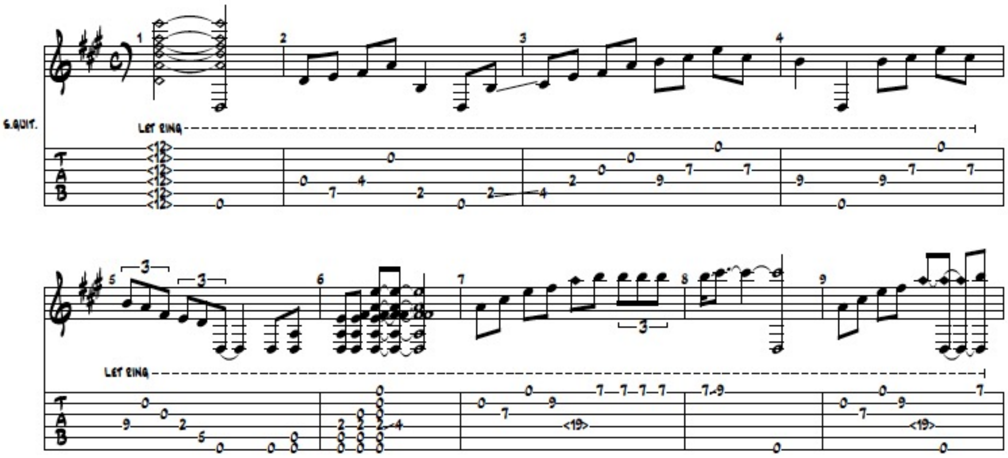


Figure 5.35 Alap

Audio (B) 5.13 Alap

Conceptual >	Dialogical >	Allusions to sitar
Acoustic >	Timbre >	Resonances, open strings, harmonics
Musical >	Harmonic >	Mostly static harmony reminiscent of drone during alap
Physical >	Instrument >	Use of tuning system as referent

Figure 5.36 Analysis of previous figure

Further examples:

Audio (B) 5.14 Alap Live Example

Audio (B) 5.15 Improvisation/Songbird at Edinburgh Guitar Night 2018

5.5.4 Linear Approach Analysis

Linear approaches were formulated to simulate some of the ways an electric guitarist of the jazz idiom may approach improvisation. For the most part a monophonic texture is employed making use of scalar patterns and licks rather than harmonic devices. Examples are in DADGAD tuning using fingerstyle technique, allowing any improvisatory devices to be easily assimilated into my creative practice.

Tuning: DADGAD

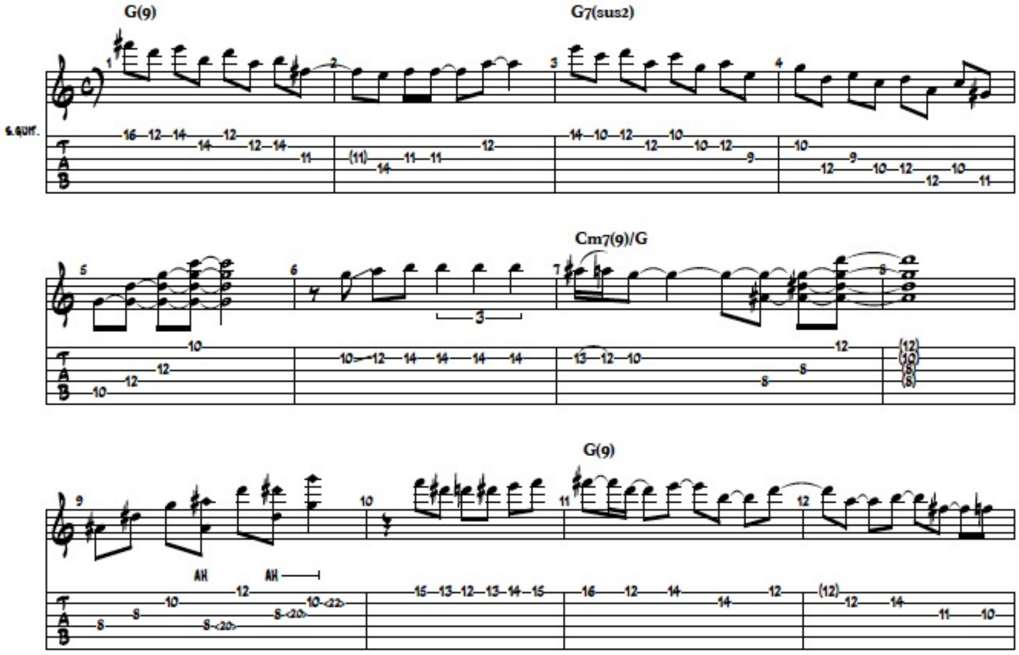


Figure 5.37 Linear approaches using superimposed pentatonics over changes to Towner's 'Icarus'

Audio (B) 5.16 Linear approach 1 (Icarus)

Musical >	Melodic/Scalar >	Superimposition of pentatonic scales.
Musical >	Melodic/Scalar >	Chromaticism (bar 10)
Physical >	Technical >	HHT (bar 9)

Figure 5.38 Analysis of previous figure

Superimposition of pentatonic scales: In bar 1 a D major pentatonic scale is superimposed over a Gadd9 giving chord tones 3, 5 and extensions 6, 7, 9. In bar 2 a C major pentatonic is superimposed over a G7 giving chord tones 1, 5 and extensions 2, 4, 6. The intervallic structure for each line is the same. Beginning at the top of the scale position the formula is: -2 scale degrees +1 scale degree (repeat).

5.5.4.1 Linear Pentatonics with an 'Outside' Approach

The following example demonstrates similarly linear material, but with 'outside' approaches. In other words, some of the scales used are harmonically distant from the underlying harmony.

Tuning: DADGAD

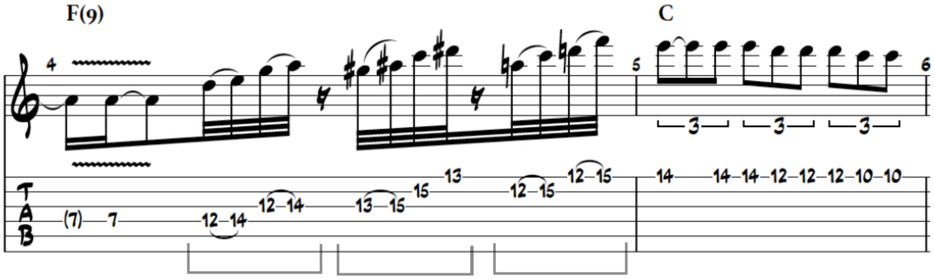


Figure 5.39 'Outside' linear approaches

Audio (B) 5.17 'Outside' linear approach (0:09-0:14)

Conceptual >	Theoretical >	Use of 'outside' pentatonic scales. C major pentatonic runs are interpolated by G# major pentatonic runs.
Physical >	Shape >	Scalar patterns (C, G#) in close proximity
Musical >	Melodic/Scalar >	C and G# major pentatonic runs share one common-tone used as an anchor (bar 4). Chromatic resolution to chord tone of next bar (bar 5).
Conceptual >	Aesthetic Descriptor >	Spiralling quality

Figure 5.40 Analysis of previous figure

Bar:	4			5
Chord:	F(9)			C
Scale:	C major pent.	G# major pent.	C major pent.	
Notes:	D, E, G, A	G#, A#, C (B#), D#	A, C, D, F	E

Figure 5.41 Pitch-harmony analysis of fig. 5.39

Bar 10 features a variation of the same device over a Bb chord in descending, rather than ascending sequence.

Tuning: DADGAD

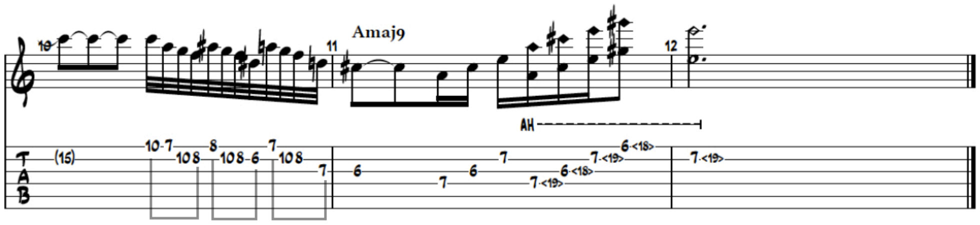


Figure 5.42 'Outside' linear approach ex.2

Audio (B) 5.18 'Outside' linear approach (0:27-0:34)

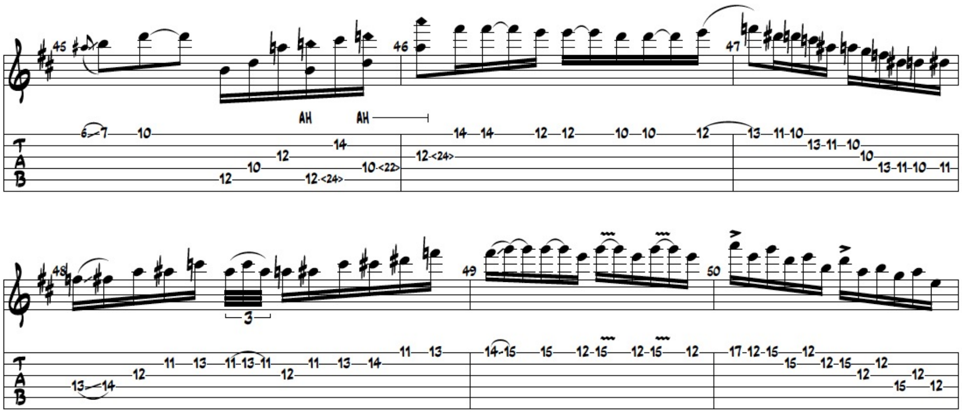
Here a D# major pentatonic scale is interpolated between two F major pentatonic figures. In this case there are two common-tones (G, F) and two chromatically altered tones (A# and D#).

Bar:	10			11
Chord:	Bb			Amaj9
Scale:	F major pent.	D# major pent	F major pent.	
Notes:	C, A, G, F	A#, G, F, D#	A, G, F, D	C#

Figure 5.43 Pitch-harmony analysis of fig. 5.42

5.5.4.2 Linear Approaches in Practice: Tir na nÓg solo

These linear approaches were incorporated in my general creative practice. Since they were developed in DADGAD tuning and used fingerstyle techniques, they were easily assimilated. The example below is an excerpt from my solo on *Tir na nÓg* from the Dionys Ensemble EP *Orchard.*



Tuning: DADGAD

Figure 5.44 Tir na nÓg: demonstration of linear approaches in general creative practice.

Audio (B) 5.19 Linear approaches in Tir na nÓg

5.5.5 Tripartite Approach Analysis

The term tripartite refers to the three-part structure of the following device, comprised of a bass voice, a percussive voice and a melodic voice. The idea was to have some voices invariant and others variant. The percussive voice, for example, is invariant and remains consistent throughout. The bass voice is invariant in rhythm but is variant in pitch. The melodic, or top voice is variant in both pitch and rhythm. This is a fairly technically demanding device, therefore three progressively complex examples are demonstrated below. The first consists of metric displacement of the top voice starting on beat one and moving forward one semiquaver each bar. The bass comprises open strings only to allow focus on this aspect.

	Pitch	Rhythm
Melodic (top) voice	Variant	Variant
Percussive voice	Invariant	Invariant
Bass voice	Variant	Invariant

Figure 5.45 Potential for pitch and rhythm variance in tripartite approach

Tuning: DADF#AE

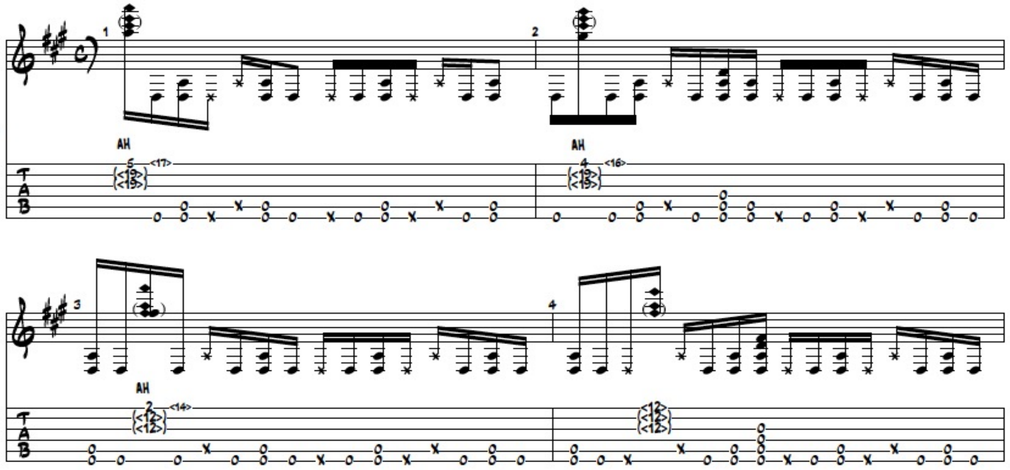


Figure 5.46 Tripartite ex.1

Audio (B) 5.20 Tripartite ex.1

The second example builds upon the first, using the same metric displacement of the top voice while fretting a Gadd9(#11) chord – a transposable shape.

Tuning: DADGAD

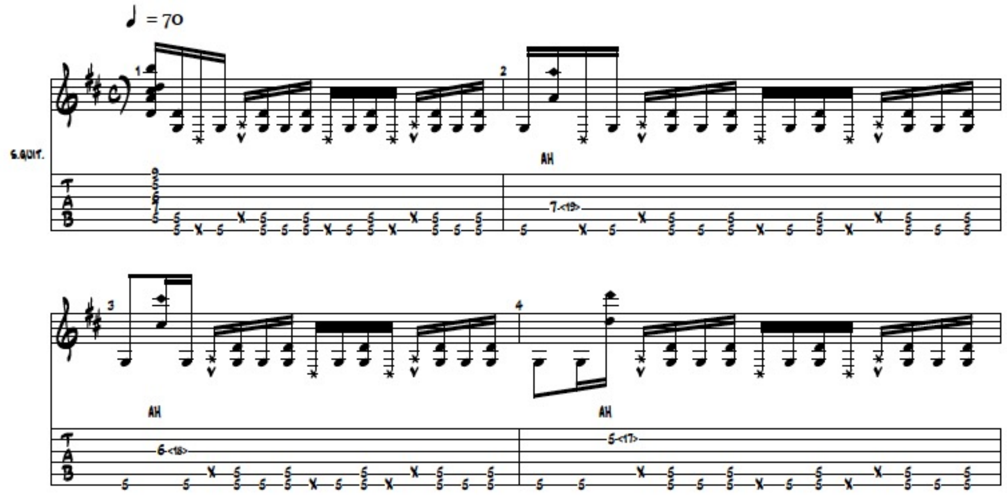


Figure 5.47 Tripartite ex.2

Audio (B) 5.21 Tripartite ex.2

After practicing these examples to attain some degree of knowledge compilation, I was able to start incorporating them into improvisations. Example 3 demonstrates an improvised approach with variable bass pitch and melodic pitch.

Tuning: DADF#AE

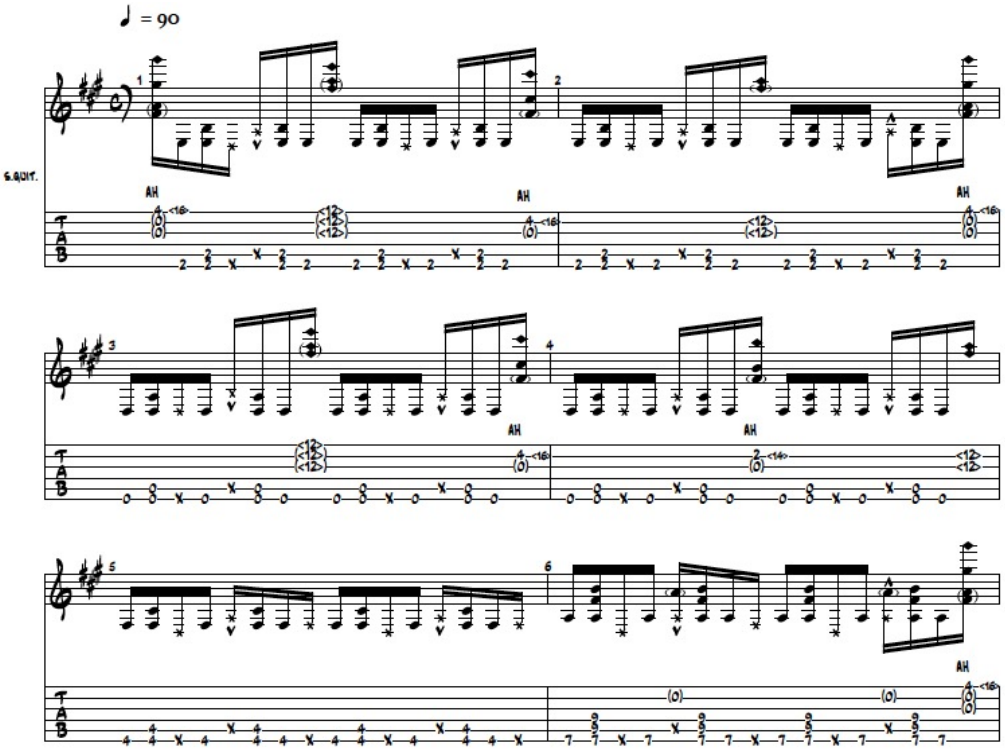


Figure 5.48 Tripartite ex.3

Audio (B) 5.22 Tripartite ex.3

Physical >	Technique >	Tripartite structure, use of extended techniques: slap harmonics and percussion
Acoustic >	Textural >	Impression of a multi-voice, multi-instrumental texture

Figure 5.49 Analysis of previous figure

5.5.5.1 Other Tripartite Structures

The tripartite structure was prevalent in other pieces, though in different forms. For example, the following excerpt from *Orchard* (from my EP of the same name) features a drone note (e), a three-note ostinato, and harmonics. Bars 43 and 44 demonstrate the superimposition of the three voices. The bass plays on beat one, the three-note ostinato begins on beats two and five of each bar and the harmonics mark the pulse on beats one and four.

Tuning: EAbDbGbBEb

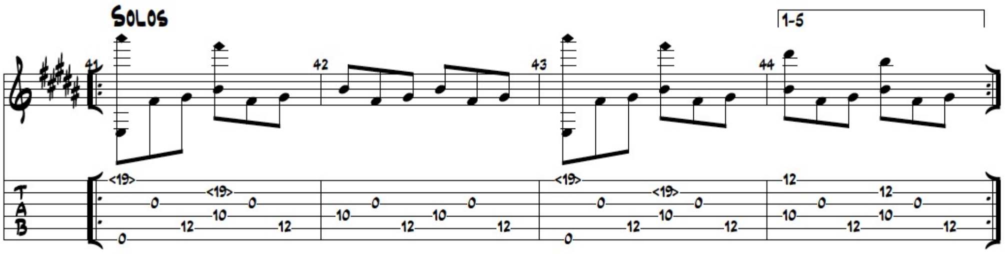


Figure 5.50 Orchard: other tripartite structures

Audio (B) 5.23 Orchard solo section

5.5.6 Implied Polyphony and Towner's 'Spotlight Panning' Concept

Implied polyphony refers to the allusion of more voices than are explicitly stated. This was observed in an earlier chapter in the work of Leeb and Towner. Towner uses this approach in his compositions and improvisational sections in which he advocates using attention like a spotlight panning from one area of interest to another. (Towner, 1985, p.37). For Towner, it is often desirable to focus on a single part at a given time, while maintaining a general impression of the whole.

An etude was constructed in order to practice this 'spotlight panning' approach. A relatively simple melody was created to accommodate focus on this aspect rather than the development of harmonic/melodic concepts. There is an improvisatory element in that basic chord qualities are suggested but specific instructions on their position and realisation are not. Therefore a degree of freedom is built in with regards to how the chords are realised and vamped between melodic phrases.

Acoustic >	Texture >	Panning between areas of interest
Physical >	Shapes >	Locating appropriate chord shapes, allowing for easy and/or simultaneous execution of melody.
Physical >	Technical >	Execution of melody while maintaining at least one chord tone in the bass
Musical >	Rhythmic >	Vamping chords in between melodic statements

Figure 5.51 Analysis of etude 3

Etude 3

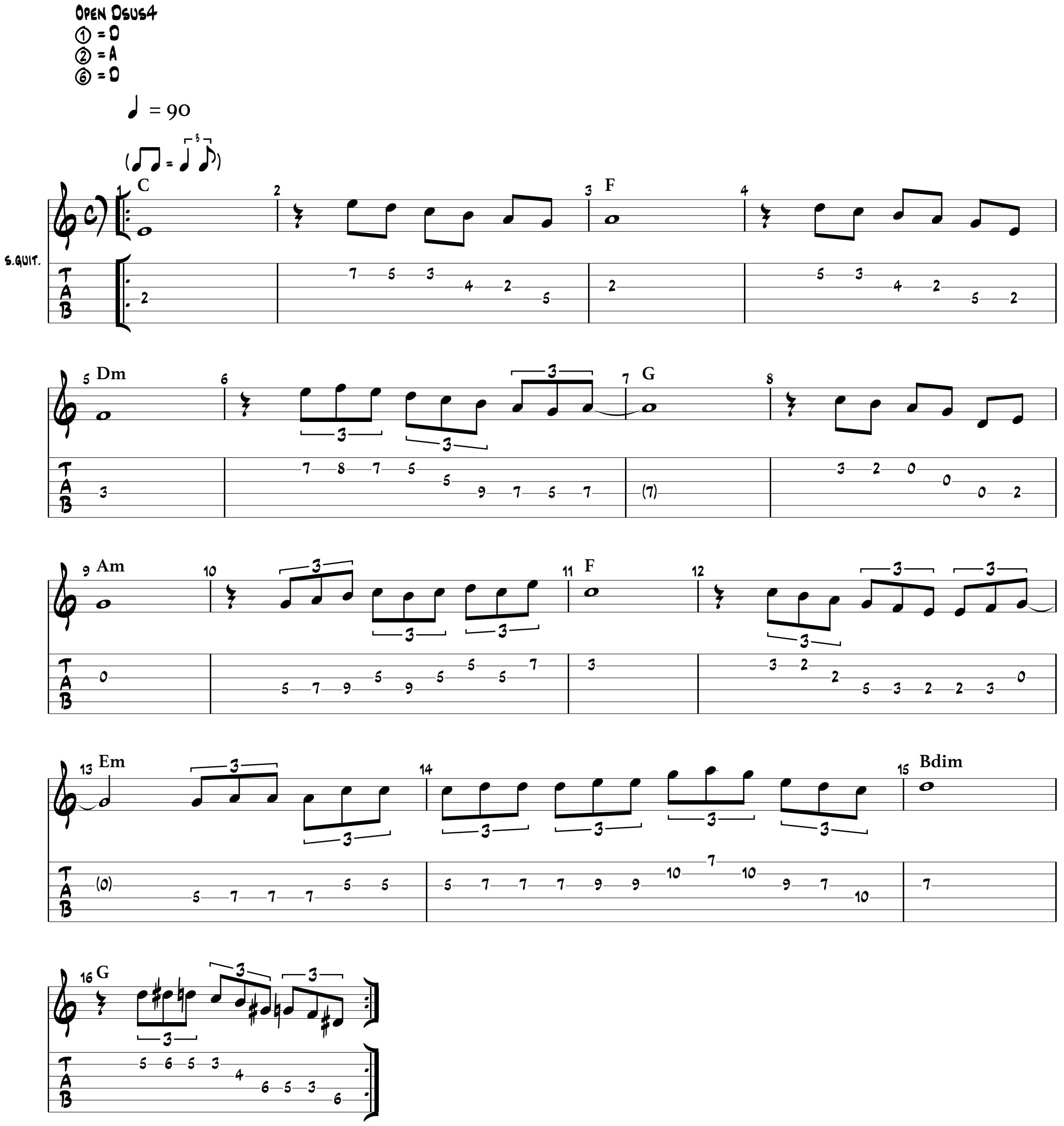

Open Dsus4
① = D
② = A
⑥ = D
♩ = 90
C
F
Dm
G
Am
F
Em
Bdim
G
S.Guit.
T
A
B

Figure 5.52 Towner's 'spotlight panning' approach: etude 3

Audio (B) 5.24 Etude 3

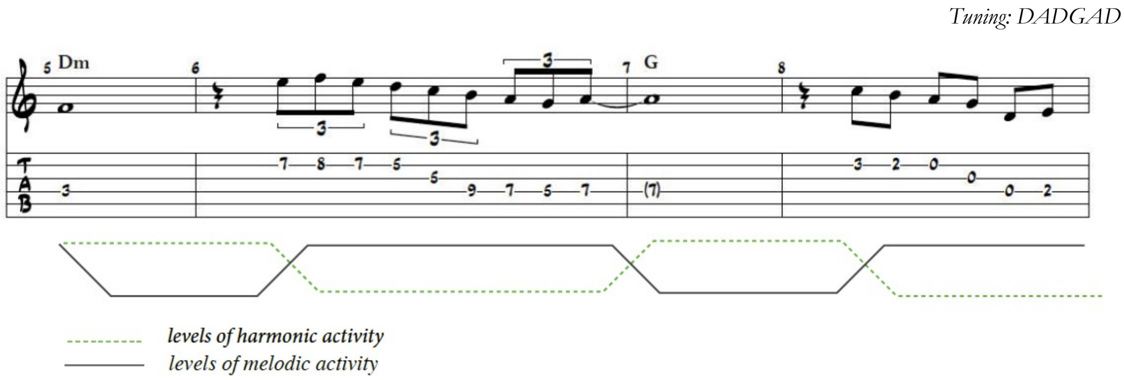

Tuning: DADGAD
5 Dm
6
7 G
8
levels of harmonic activity
levels of melodic activity

Figure 5.53 Levels of harmonic and melodic activity in etude 3

5.5.6.1 Implied Polyphony in Tir na nÓg

Tir na nÓg is an example of interweaving two melodies, giving the impression of two instruments, or a two-handed instrument such as the harp, without really being polyphonic. The title refers to a supernatural realm or “Otherworld” in Irish mythology, in which “[d]eath and decay” never befall its citizens (Rolleston, 1911/1990, p.171).

As can be observed in the tablature, there is very little convergence of voices, except where the function is harmonic; i.e. stating the underlying chord. The implied interweaving voices are presented in the standard notation below the tablature:

Tuning: DADGAD

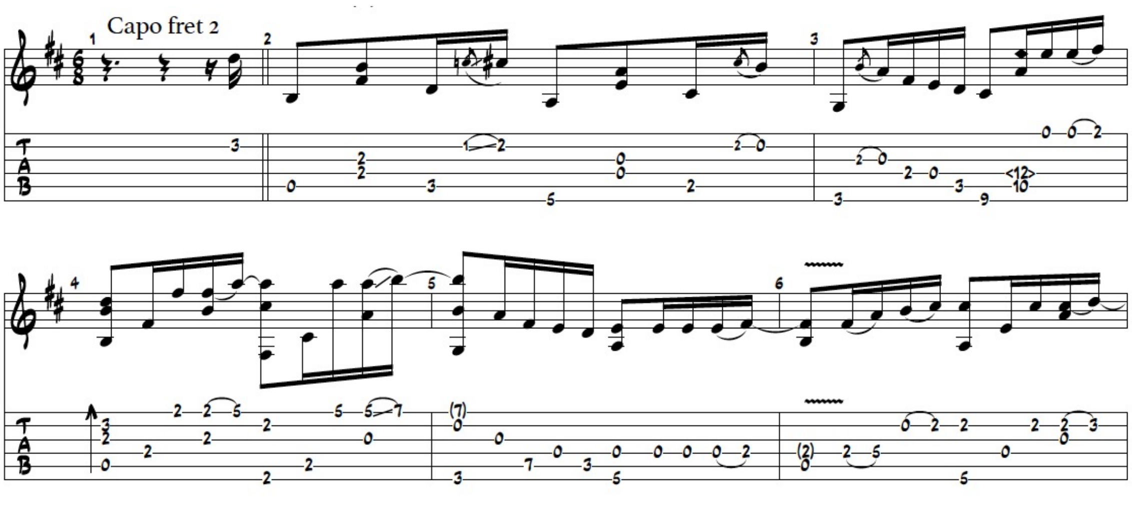


Figure 5.54 Tir na nÓg excerpt

Audio (B) 5.25 Tir na nÓg intro excerpt

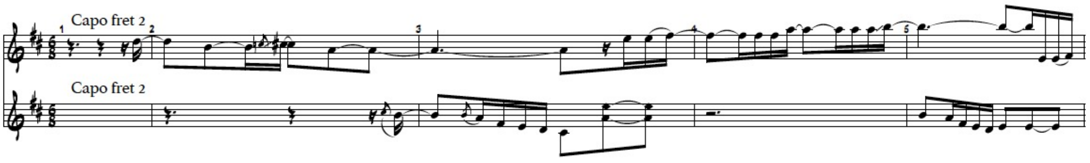

Capo fret 2
Capo fret 2

Figure 5.55 Tir na nÓg interweaving melodies

5.5.7 Harmonic Approaches in DADGAD

Part of the aim of this thesis was to develop links between conceptual knowledge and physical mechanics in a way that is often neglected in contemporary fingerstyle guitar as a result of the various tuning systems used. This involved the development of a harmonic knowledge base in DADGAD which included the construction of etudes and the arrangement of improvisational models for solo guitar. This led to greater harmonic facility in DADGAD which is demonstrated in the solo guitar improvisations (*DADGAD Improvisations I, II* and *III*) as well as the compositions for ensemble (*Lila* and *Tir na nOg*).

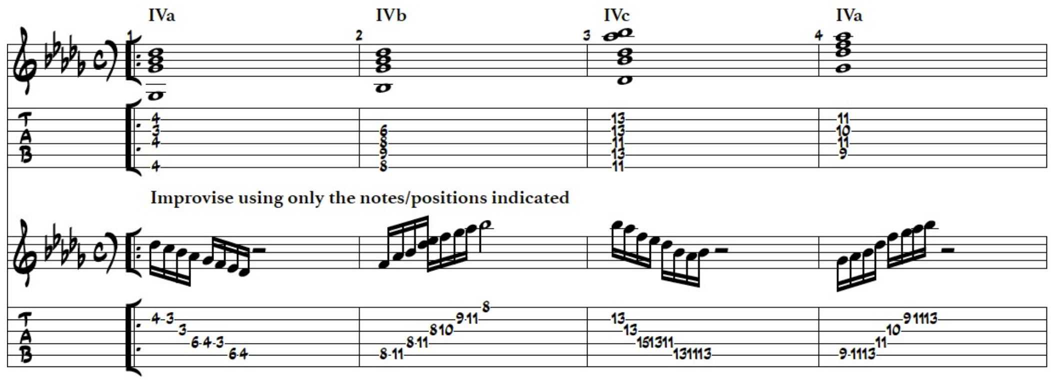
5.5.7.1 Harmonic Etude Overview

The purpose of this etude was the familiarisation of chord shapes, inversions and corresponding scalar patterns in DADGAD. It was deliberately formulated in an awkward key (Db major) so that familiarisation with diatonic harmony in said key would be easily transferrable into more accessible keys (C, D, G etc.). The referent here is a chord progression with each chord undergoing systematic inversions.

Chord	Positions played	Bar	Diatonic Function
Gb	Root, 1st and 2nd inversion, root (octave)	1-4	IV
Db	Root, 1st and 2nd inversion, root (octave)	5-8	I
Bbm	Root, 1st and 2nd inversion, root (octave)	9-12	vi
Ebm	Root, 1st and 2nd inversion	13-16	ii
Ab	Root, 1st and 2nd inversion, root (octave)	17-20	V
Db	Root, 1st and 2nd inversion, root (octave)	21-24	I

Figure 5.56 Harmonic overview of etude 4

The transcription displays two staves: one for the chord position, and the other for the corresponding scalar position. The idea was to have the scale easily accessible while maintaining the chord. Each chord was given four bars, each bar representing an inversion: (1) root, (2) first inversion, (3) second inversion, (4) root, usually one octave higher. Therefore, with enough practice and enough knowledge compilation, the aim was that this etude would facilitate access to chords and corresponding scales across the fretboard, as well as develop fluid connections between positions.


Tuning: DADGAD

Improvise using only the notes/positions indicated

Figure 5.57 Excerpt from etude 4: chords, inversions and corresponding scalar patterns

5.5.7.2 Improvised Realisation of Etude

The improvised realisation of the etude is much more elastic in terms of rhythm. For example bars 1 and 2 of the etude are allotted four bars each in the improvisation, while bars 3 and 4 are allotted two bars each.

Tuning: DADGAD

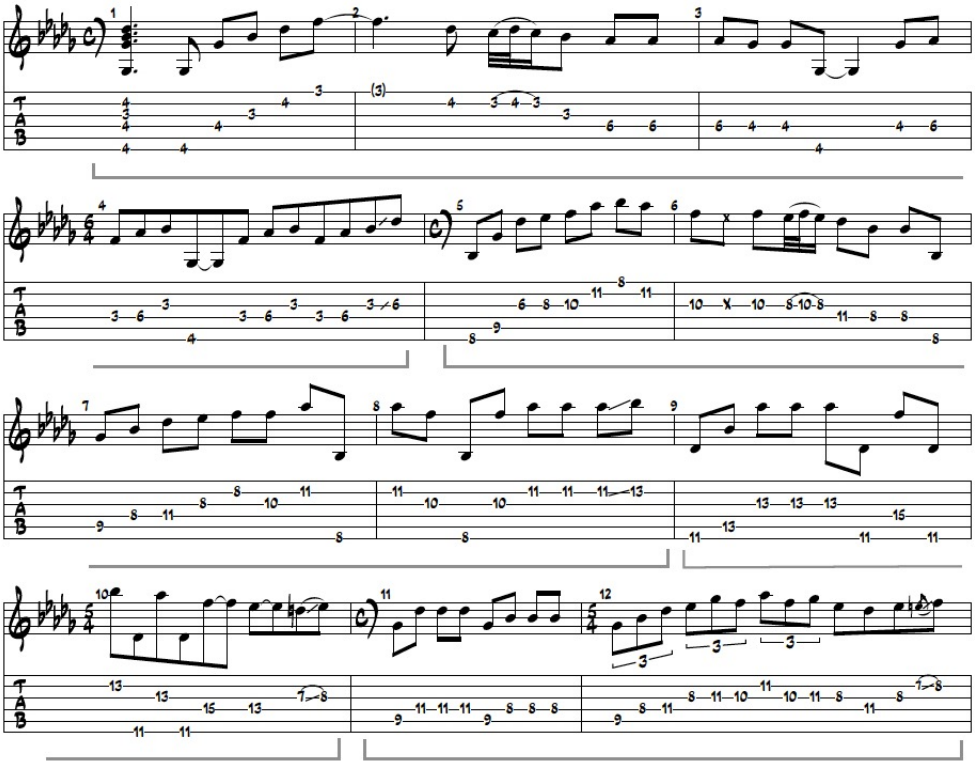


Figure 5.58 Excerpt from improvised realisation of etude 4

Audio (B) 5.26 Improvised realisation of etude 4 (aka DADGAD improvisation I)

5.5.7.3 Improvisational Model: A Lotus on Irish Streams

Harmonic vocabulary was also developed through the use of improvisational models. The arrangement of *A Lotus on Irish Streams,* for example, imposed harmonic language that is fairly awkward to execute in DADGAD, yet served to further expand the harmonic knowledge base.

Below are two examples of the harmonic structure being realised in various ways. The first is from the arrangement and the second is an improvisation on the harmonic structure of the arrangement. Although the former contains a degree of improvisation, the latter is fully improvised with the exception of the harmonic structure acting as the referent.

Tuning: DADGAD

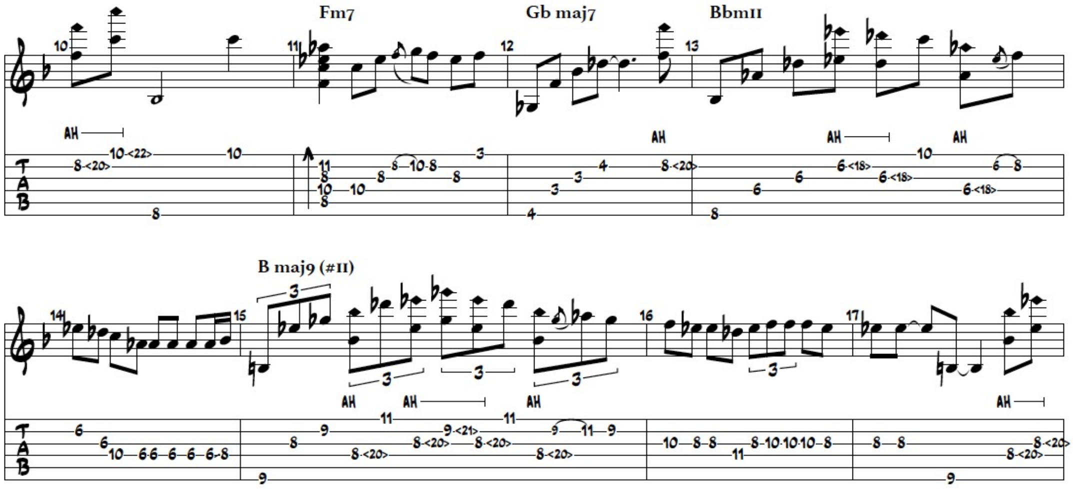

Fm7
Gb maj7
Bbm11
B maj9 (#11)
AH
T
A
B

Figure 5.59 Excerpt from the solo guitar arrangement of A Lotus on Irish Streams

Audio (B) 5.27 Lotus comparison (arrangement)

Tuning: DADGAD

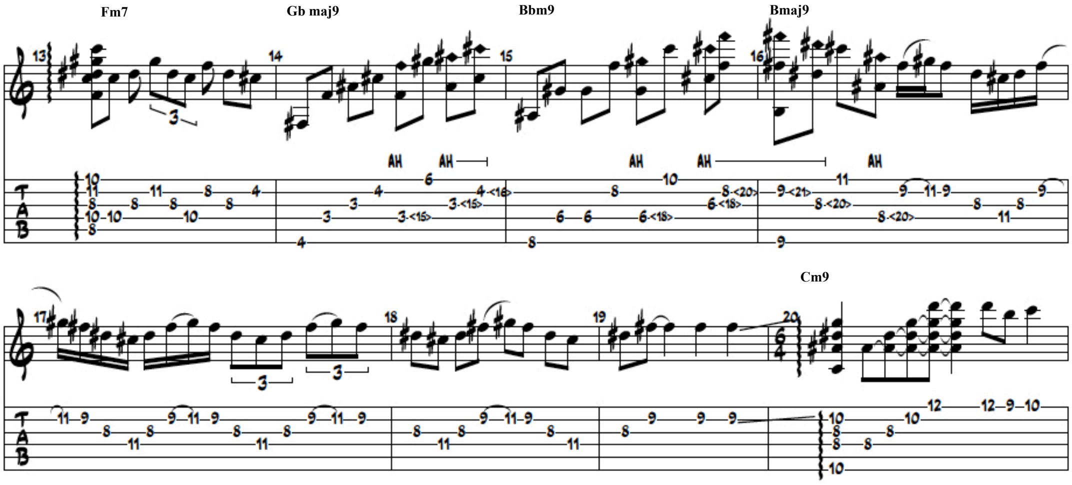

Fm7
Gb maj9
Bbm9
Bmaj9
Cm9
AH
T
A
B

Figure 5.60 Excerpt from the improvisation on A Lotus on Irish Streams (aka DADGAD Improvisation III)

Audio (B) 5.28 Lotus comparison (improvisation)

5.5.7.4 Harmonic Vocabulary in *Lila*

Lila is the second track from the Dionys Ensemble EP *Orchard*. The title of the track was derived from the Sanskrit word *lila,* which loosely translates as 'play', although "[r]icher than our word, it means divine play, the play of creation, destruction, and re-creation, the folding and unfolding of the cosmos." (Nachmanovitch, 1990, p.1). Musically, it is fairly minimalist, using three and four note chord voicings. The harmonic progression is as follows:

Gsus2#11	Asus2 (13)	F#m	Gmaj7
Dmaj7	Esus2	F#5	Gmaj7
A/D	A (9,13)	Gsus2#11	Asus2

Figure 5.61 Harmonic progression of Lila

A repetitive two note motif runs throughout the entire sequence on the 'two and' beat of each bar comprising an alternating C# and B finally falling to an A in bar 16:

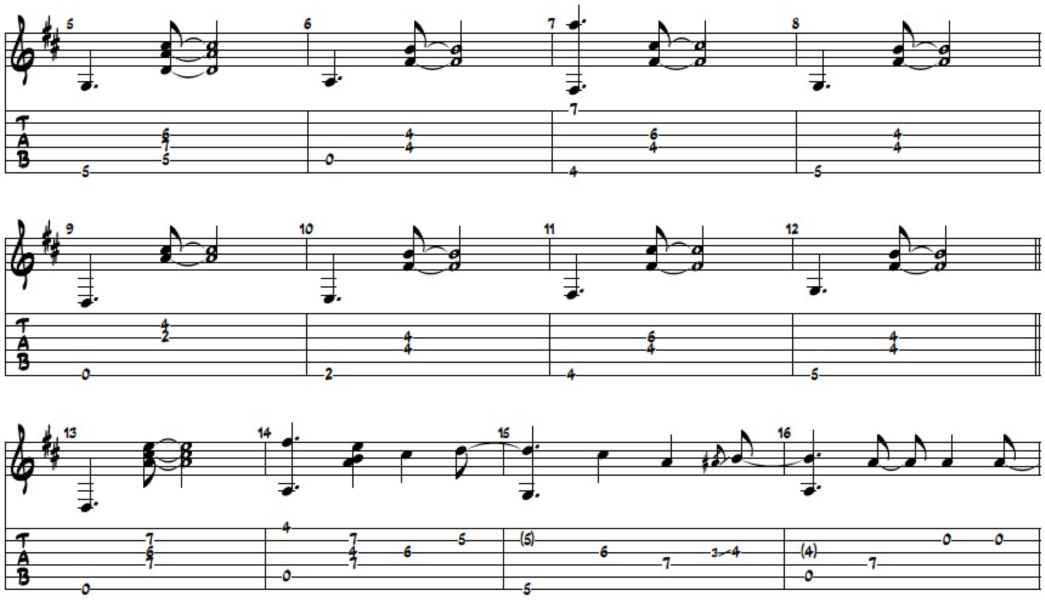

Tuning: DADGAD

Figure 5.62 Lila ex.1

Audio (B) 5.29 Lila (0:07-0:27)

The sweetness of the G Lydian thus far is then interrupted by a series of chromatic chords each lasting 1.5 beats giving it a syncopated 3/4 feel. Each chord is linked to the next by at least one chromatic tone until the Gsus2(#11) which moves up to Asus2(#11): a constant structure movement by a whole tone. This functions to modulate the entire theme as it is subsequently repeated in A Lydian.

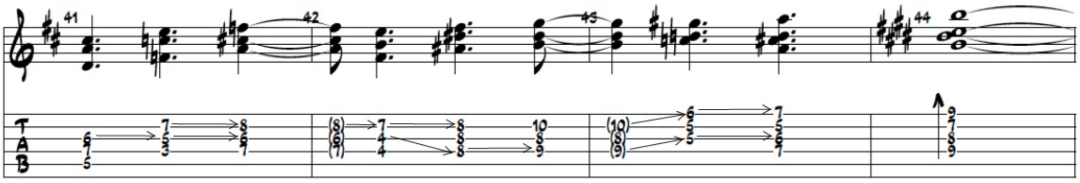

Tuning: DADGAD

Figure 5.63 Lila ex.2

Audio (B) 5.30 Lila (1:06-1:13)

The harmony during the guitar solo begins in A Lydian for the first six bars, however it is interrupted once again with a series of chromatically linked chords, leading chromatically back the original theme in G Lydian:

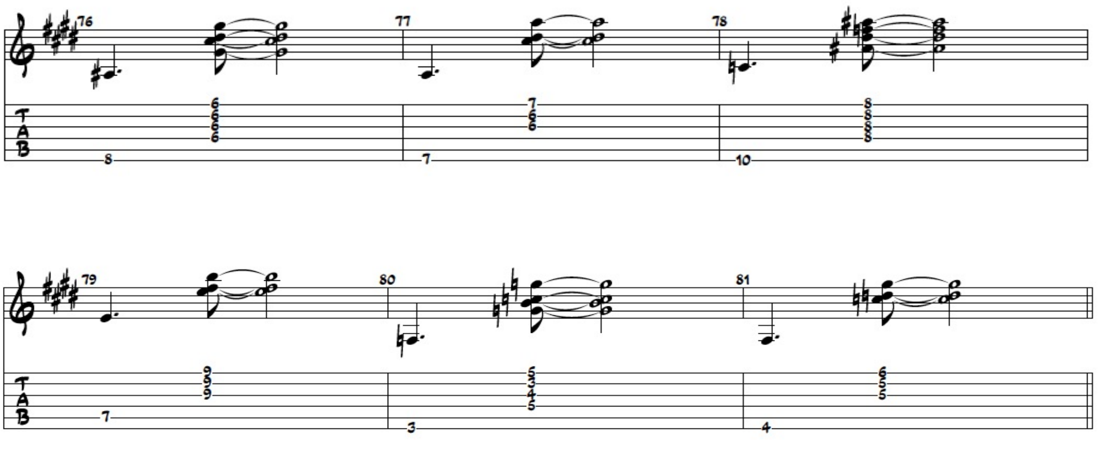

Tuning: DADGAD

Figure 5.64 Lila ex.3

Audio (B) 5.31 Lila (2:06-2:16)

Absus4/Bb	Amaj7(#11)	Bbsus4/C
Bsus4/E	Fsus2(#11)	D7#11/F# (no 5)

Figure 5.65 Harmonic progression during guitar solo in Lila

5.6 CASE STUDY ANALYSIS: SOLO GUITAR IMPROVISATIONS

Both of the following improvisations were recorded with a Zoom H4n portable recorder. Therefore the audio quality, while acceptable, is not of a professional level. The decision was made not to record improvisations in a professional setting as it would likely interrupt the flow state that is often attained in live performances and in the practice room. Recordings contain audio-only as I felt video recording would bring a degree of self-consciousness that was not necessary. However, this meant that fretboard positions were often unknown and had to be estimated in the transcription. The improvisations, by nature, include free time sections, rhythmic elasticity, extended techniques and technical fumbles, presenting further challenges. That said, the transcriptions proved to be useful and necessary tools for my own reflective practice as they illuminated implicit devices and approaches.

Subsequent analysis will be informed by the five-aspect approach. However, because of the creative nature of autotelic practice, each improvisation requires a unique vantage point and therefore a less systematic analytical approach is adopted.

5.6.1 DADF#AE Improvisation

The reader can refer to 10.1 DADF#AE Improvisation in Volume II for the full transcription.

This improvisation utilised a tuning I had been experimenting with for a few years in my general creative practice: DADF#AE, giving an open Dadd9 chord. Pieces in my repertoire such as Leeb's *Fishbowl* and my own arrangements of Kate Bush's *This Woman's Work* and Fleetwood Mac's *Everywhere* also used this tuning. My original composition *Slipstream* used a variation on this: DAEF#AE. In contrast to DADGAD, tunings such as these are often considered fairly specialised. Compositions/arrangements often exploit the available diatonic open strings and harmonics, rarely straying far from home.

The impetus for this improvisation was to take the opposite approach. Rather than exploit the tuning throughout the piece, diatonic material relating to the tuning was used as an anchor point, punctuating explorations of other colours. The tuning did impact the material in other ways, however. For example, bar nine demonstrates an Amaj7 chord followed by a Lydian #2 run. This is comfortable to execute as it spans only two frets for the first five movements as a function of the intervallic distance between the fourth, third and second strings in DADF#AE tuning. This makes it easy to produce a second octave of the scale using artificial harmonics as can be observed in bar 10 and 11.

Tuning: DADF#AE

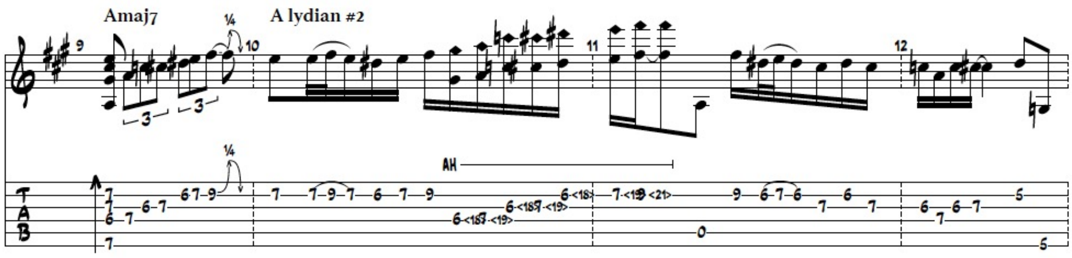


Figure 5.66 DADF#AE improvisation ex.1

Audio (B) 5.32 DADF#AE improvisation (0:20-0:29)

Two pickup sources were connected to an amplifier: one was the 'pure' acoustic sound from a K&K trinity pickup (soundboard transducer and internal microphone); the other was a magnetic pickup through an amp simulator pedal, producing an overdriven and compressed 'electric guitar' sound. This meant that scalar runs could be more easily executed as a result of the attack and sustain qualities of the amp simulator, while maintaining the 'acousticness' of the instrument.

The referent in this case was a loose progression of chords and corresponding scalar patterns that had been constructed beforehand. The construction was largely guided by implicit aesthetic criteria rather than any explicit theoretical idea. The 'anchor point' referred to above denotes the Aadd9/C# - Asus2/D – Aadd9 – Asus2/D in bars twenty-two to twenty-six respectively. It comprises a short arpeggiated motive that makes use of the A and D bass strings and can be vamped for an indefinite period of time, allowing the performer to take some time before proceeding.

Chord	Scale	Bar	Notes
E (13)	E Lydian dominant	1-8	
Bdim/F		8	Passing chord
Amaj7	A Lydian #2	9-12	
G	G Lydian	13-14	Chromaticism
D/F#	F# min blues	15-18	Chromaticism
Dm6/F	F Lydian	19-21	Minor iv - I (Dm – A)
Aadd9/C#		22, 24	Resolution to inverted I chord
Asus2/D		23, 25	
Aadd9		26	Resolution to root position I chord
Asus2/D		27	
B/F#	D# Locrian	28	
D (#11)	D Lydian	29-31	
B7	B Phrygian dominant	32-34	V7 of E
E (13)		35	

Figure 5.67 Pitch-harmony analysis of section A (DADF#AE improvisation)

Some approaches developed in the teleological methodology emerged, if only in approximate forms. Much like Schmidt's (1975) *generalised motor program* (GMP) in which a given movement class is abstracted and remains parametrically tuneable across a number of dimensions, *concepts* (rather than motor patterns) from the teleological methodology were abstracted and applied to the current improvisation. For example, moving constant structure patterns in whole steps was observed in the HHT etudes; the linear approaches; and the improvisational model. This device can be observed in the linear explorations of the current improvisation. Although the patterns vary slightly (i.e. are parametrically tuneable) the general movement class (GMP) is the same.

Tuning: DADF#AE

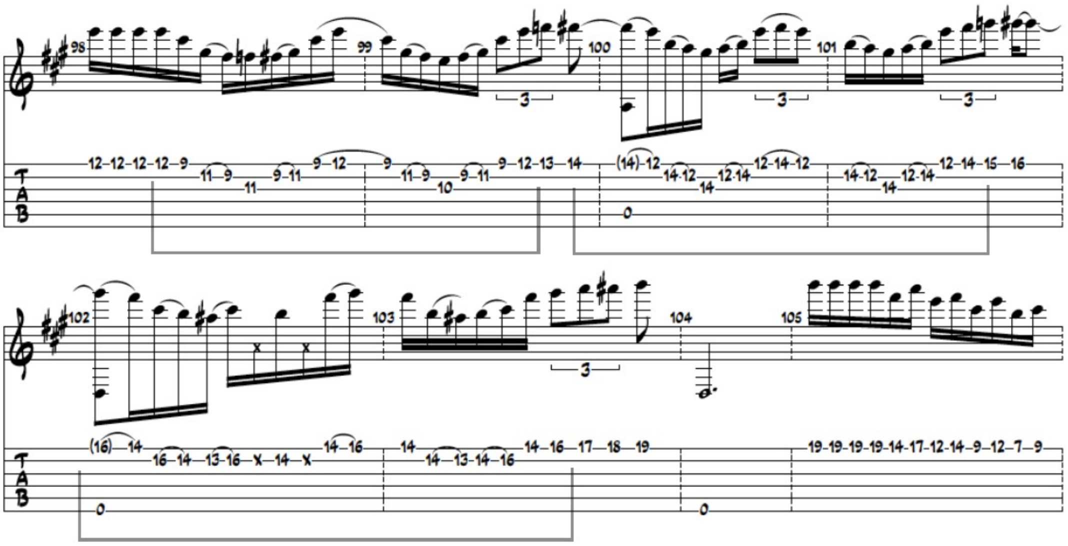


Figure 5.68 DADF#AE improvisation ex.2

Audio (B) 5.33 (3:21-3.37)

Another example of this conceptual transfer is the use of a tripartite structure. However the structure has been modified, this time comprising bass (RH), harmonics (RH) and melody (LH). The separation of right and left hands means there is greater room for independence between melodic material and bass/harmonics. The bass and harmonic voices articulate an ostinato sequence using open strings, and therefore do not require left hand fretting. The left hand is then free to initiate notes independently of the right hand.

Tuning: DADF#AE

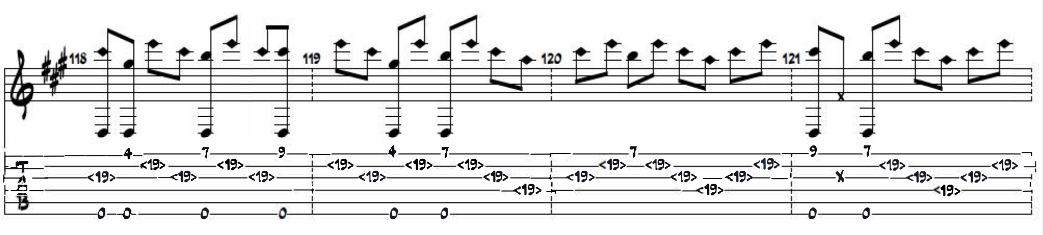

118
119
120
121
T
A
B

Figure 5.69 DADF#AE improvisation ex.3

Audio (B) 5.34 (4:00-4:07)

5.6.2 DADGAD Improvisation II

The reader can refer to 10.3 DADGAD Improvisation II in Volume II for the full transcription.

This improvisation explores various stylistic models in one longer-form improvisation. This was inspired by Peter Elsdon's paper entitled *Style and the Improvised in Keith Jarrett's Solo Concerts* (2008) in which Jarrett's solos are deconstructed as comprising various 'stylistic models' (p.52) including categories such as free counterpoint, extended techniques (p.54) folk ballad (p.59) and blues vamp style (p.61). The focus of the following analysis is therefore macro-structural.

Six stylistic models were loosely established beforehand. Each stylistic model served as an individual referent for each point in the improvisation. Therefore some referents were more conceptual while others were more technical. For example, using *Alap* as a referent, provides the constraints: *limited harmonic movement, free time, let resonate* etc. Whereas *Tripartite* as a referent refers to a specific technical device which has been encoded through teleological practice.

	Stylistic Model	Bars	Timestamp
1	Alap	1-9	0:00-0:20
	Harmonic Outline for Tripartite	10-15	0:21-0:45
2	Tripartite	16-56	0:46-2:11
	Transition	57-68	2:12-2:46
3	Electronic (Static Harmony)	69-86	2:47-3:53
4	Electronic (Harmonic Movement)	87-112	3:54-5:41
5	Folk song	113-137	5:42-6.48
	Tripartite (Transition)	138-145	6:49-7:13
6	Percussive Konnakol	146-169	7:14-8:32

Figure 5.70 Structural analysis of stylistic models in DADGAD improvisation II

Alap

The performance begins with an alap-style improvisation, as a way of settling in and reducing tension. An indefinite period of time was allocated and the cue for segueing into the next stylistic model was simply emotional: when I felt comfortable and relaxed I could move on to the next one. As has been established, the alap features lots of open strings, resonances and no harmonic movement.

Tuning: DADGAD

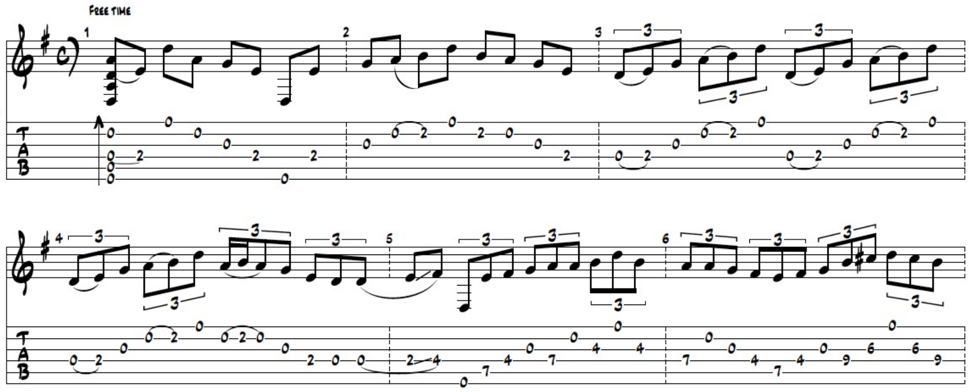


Figure 5.71 DADGAD improvisation II: alap

Audio (B) 5.35 DADGAD Improvisation II (0:00-0:13)

Tripartite

This model comprises as 6/8 groove using a tripartite structure (bass, percussion, melody). The metric position of the melodic/top voice is static but the pitch and harmony are variable. The percussive pattern is largely constant with minor variations to allow for the harmonics to be executed. The harmony largely comprises two alternating chords: D(9) and Em11

Tuning: DADGAD

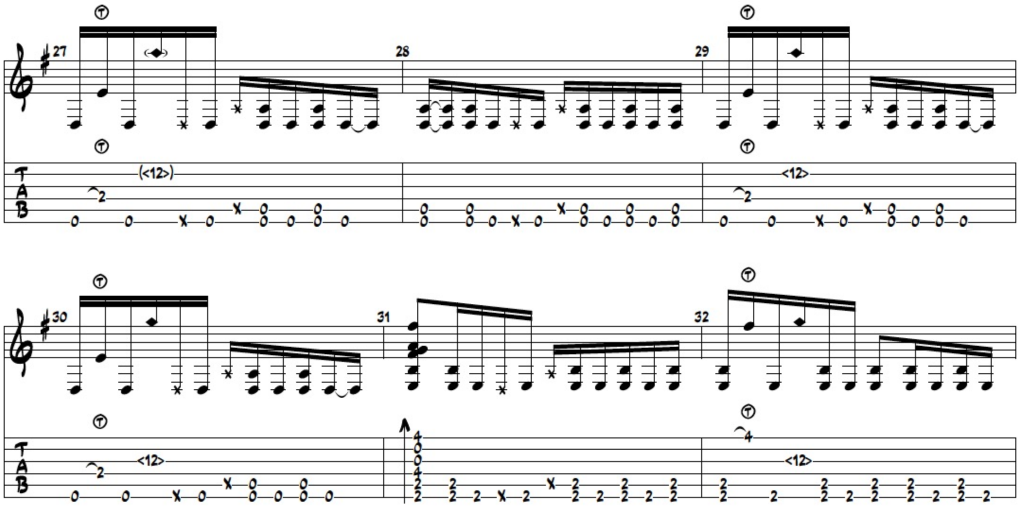


Figure 5.72 DADGAD improvisation II: tripartite

Audio (B) 5.36 (1:11-1:24)

Electronic (Static Harmony)

This model makes use of a ‘freeze’ pedal (in this case an EHX Superego) to sustain harmonic material so that linear material can be explored freely. The harmony in this instance is a static drone (D) and the linear material is broadly Lydian.

Tuning: DADGAD

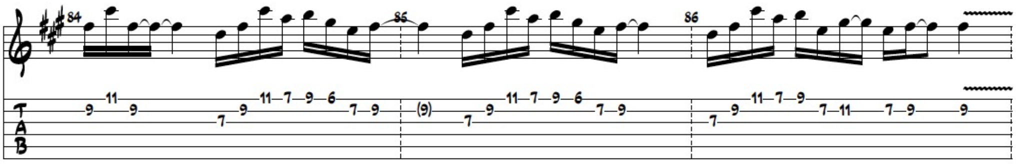


Figure 5.73 DADGAD improvisation II: electronic (static harmony)

Audio (B) 5.37 (3.37-3:50)

Electronic (Harmonic Movement)

The freeze pedal is used here to sustain chords for brief periods of time, defining a chord progression:

Chord	Amaj7(13)	Am7	D7b9	A7/C#
Scale	A Lydian	A Dorian	Ab Major	Arpeggiated chord

Figure 5.74 Harmonic analysis of fig. 5.75

Tuning: DADGAD

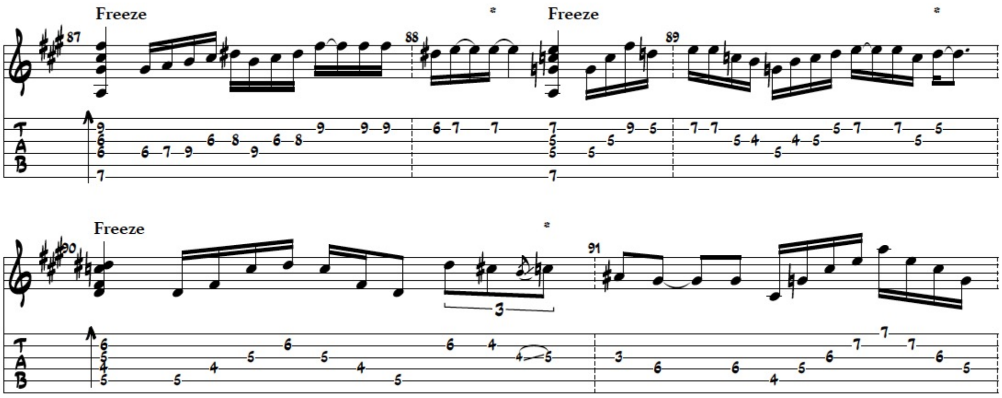


Figure 5.75 DADGAD improvisation II: electronic (harmonic movement)

Audio (B) 5.38 (3:54-4:17)

Folk Song

This model uses a standard fingerpicking technique known as Travis picking in which the thumb alternates between two bass strings while the fingers play the higher strings. It follows a harmonic progression in Dm: Dm7, Cadd9, Bbadd9(13), Am7(11)

Tuning: DADGAD

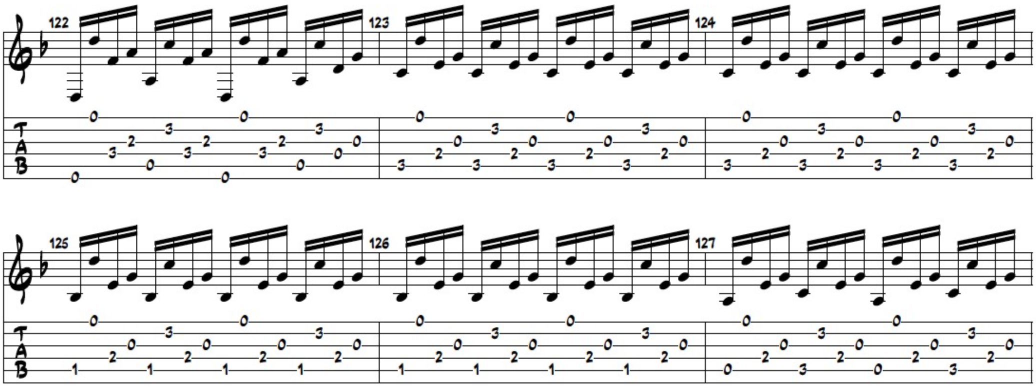


Figure 5.76 DADGAD improvisation II: folk song

Audio (B) 5.39 (6.10-6.23)

Percussive Konnakol

The piece finishes with percussive Konnakol; an approach developed in the methodology chapter of this thesis. Konnakol phrases were mapped to percussive guitar techniques allowing for fairly sophisticated rhythms to be improvised.

Tuning: DADGAD

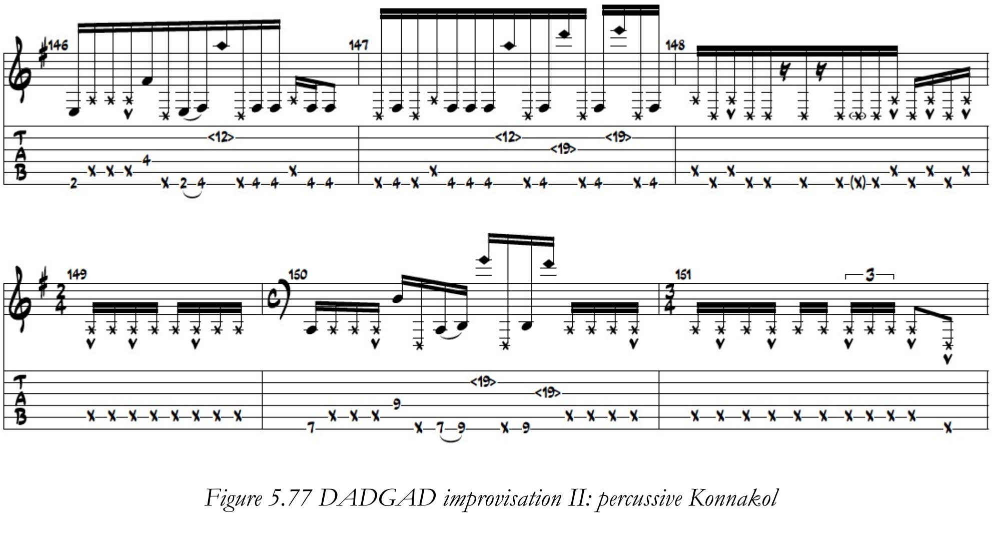


Figure 5.77 DADGAD improvisation II: percussive Konnakol

Audio (B) 5.40 (7:14-7:31)

The Konnakol groupings are denoted by the accented percussive strikes denoted by an ‘x’.

Tuning: DADGAD

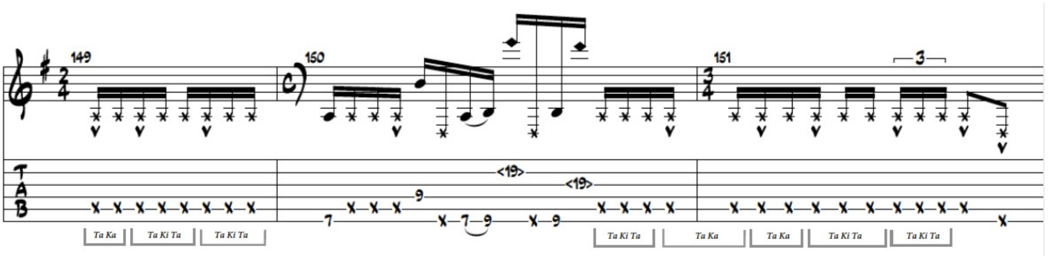

149
150
151
3
T
A
B
<19>
<19>
Ta Ka
Ta Ki Ta
Ta Ki Ta
Ta Ki Ta
Ta Ka
Ta Ka
Ta Ki Ta
Ta Ki Ta

Figure 5.78 DADGAD improvisation II: percussive Konnakol rhythmic groupings

In summary, each stylistic model contributed a unique set of properties and constraints for each improvisational section, giving the overall piece a well-defined structure. The trajectory of two ‘sub-aspects’ throughout the piece are outlined below.

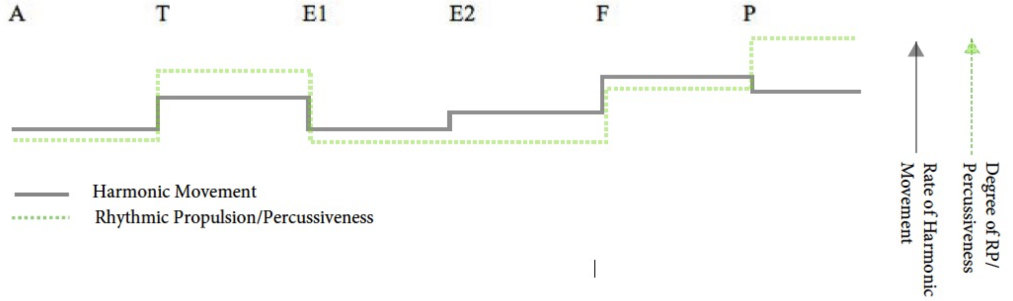


Figure 5.79 DADGAD improvisation II: graphic depiction of development

6 SUMMARY, CONCLUSIONS AND FUTURE RESEARCH

6.1 SUMMARY OF THESIS

The aim of this thesis was to develop new vocabulary and improvisational strategies for contemporary steel-string fingerstyle guitar. This was to address the apparent stagnation I felt both in my own playing and in the idiom as a whole. Many of the developments seemed to be towards technique-centric or instrument-centric concepts (e.g. instrument modifications etc.). The developments I was more interested in were primarily musical, compositional and improvisational.

Two literature reviews were presented; one addressing the key features of the contemporary fingerstyle guitar idiom; the other addressing psychological concepts relating to improvisation. The latter was divided in two sections: (1) Cognitive processes of improvisation and (2) Music practice and flow. This was to enable the development of a subsequent methodology based primarily on said psychological concepts.

The *Overview of Key Influences* chapter looked at two practitioners: Thomas Leeb and Ralph Towner. Leeb represented the vocabulary and approaches I had been developing in the preceding years. Towner represented the new approaches and vocabulary that were currently piquing my interests. The marriage of both practitioners was representative of my general aim: to assimilate the language of contemporary fingerstyle guitar with new vocabulary and improvisational approaches.

Three core research questions were devised to focus my efforts on the formulation of an effective methodology:

1. *How can I develop effective strategies for practice that encourage creativity, improvisation and flow?*
2. *How can I expand the harmonic, rhythmic and melodic vocabulary of contemporary steel-string fingerstyle guitar in new ways?*
3. *How can I assimilate these new approaches into my personal creative practice?*

The methodology devised was therefore multi-faceted. First, it included the formulation of a biphasic approach to practice based on the psychological literature carried out in the literature review. This was comprised of phase 1: teleological practice; and phase 2: autotelic practice. Teleological practice was then demonstrated through various examples including the application of Konnakol phrases to percussive guitar techniques as well as the application of musical dice games. Because of the nature of autotelic practice it was not demonstrated through a protocol, but rather in the form of solo guitar improvisations and an autotelic practice review in the subsequent chapter.

The Commentary and Analysis chapter is comprised of multiple sections also. It begins with a post hoc review of the teleological and autotelic practice methodologies as well as the development of an original analytical approach. The main analyses were divided into various stylistic models and approaches including the following categories: (1) Musical dice games, (2) Harp harmonic technique, (3) Alap approach, (4) Linear Approaches, (5) Tripartite approach, (6) Implied polyphony and Towner's concept of spotlight panning, and (7) Harmonic approaches. Finally, two case studies of solo guitar improvisations were demonstrated representing the culmination and efficacy of the methodological approaches.

6.2 ORIGINAL CONTRIBUTIONS TO KNOWLEDGE

The original contributions to knowledge of this thesis can be found in both practice and theory. In terms of practice, my personal approach to musical performance has changed dramatically over the four years. Beforehand, performances were a chance to showcase highly polished arrangements and compositions. However, the paradigm through which I now view performance is to see it as a unique point in time to explore musical possibilities. The music I play can often be fairly structured, but it always incorporates some degree of improvisation. This includes: taking an 'improvisatory approach' (i.e. variation in non-pitch dimensions such as timbre, dynamics and rhythm); solo sections within a composition (e.g. *Tir na nÓg*); introductory improvised passages (e.g. alap) and full solo guitar improvisations – something which is rarely (if ever) attempted in the contemporary fingerstyle guitar idiom. These various improvisatory approaches were not the product of musical meandering but of a rigorous and extensive programme of research and practice carried out over the past four years.

Further, the vocabulary I have developed has specifically enabled me to adopt these approaches. The vocabulary of contemporary fingerstyle guitar is often limited in its flexibility and adaptability due to the wide range of tuning systems used. Therefore, devices (technical, compositional or otherwise) tend to be highly specialised and inseparable from the tuning system. Thus they are non-transferable from piece to piece. As a result, one tuning system (DADGAD) was predominant throughout this thesis to enable the conception of various devices and their enrichment (i.e. their application to various musical contexts). This enrichment is exceptionally rare in non-standard tuning systems in the contemporary fingerstyle guitar idiom.

In addition to the utility of the vocabulary in terms of improvisation, there is also the originality of the vocabulary itself. I have assimilated the techniques acquired over years of studying contemporary fingerstyle guitar from leading practitioners (Leeb, Bensusan, McKee, DuFour, Ross) with musical approaches from practitioners of jazz and 'world music' idioms (Jarrett, McLaughlin and Towner).

For instance, the implementation of Konnakol methods to guitar phrasing is not uncommon. John McLaughlin is an example of someone who incorporates this approach. However, the mapping of Konnakol phrases to percussive guitar techniques and a systematic methodology for their assimilation into general creative practice is something I have not come across to date.

Further, there are theoretical contributions in the form of a unique practice methodology. This involved a synthesis of cognitive psychology (e.g. Schmidt, Ericsson), flow (e.g. Csikszentmihalyi) and other practical concepts from practitioners (e.g. Werner, Chase, Leonard, Herrigel) to create a biphasic practice methodology which encompasses both the mechanistic and the creative domains of artistic practice. The terms that I coined for each phase were 'teleological practice' and 'autotelic practice' respectively.

The protocol is transferrable to any musical practitioner with minimal adjustments providing they seek to develop their practical skills, vocabulary and creativity. This hybridised methodological approach also comprises methods for expanding vocabulary such as 'musical dice games', which, while not original in conception, are original in application and outline.

Lastly, the development of *aspect analysis* is a unique contribution to knowledge that has utility for other researchers and practitioners involved in musical analysis.

Summary of key developments:

- Expansion of harmonic vocabulary in DADGAD;
- Application of the harp harmonic technique to a range of harmonic contexts;
- Assimilation of linear approaches in DADGAD using fingerstyle technique;
- Mapping Konnakol phrases to percussive guitar techniques and devising methods for their assimilation into general creative practice;
- Conception of various stylistic models; structuring solo improvisations based on stylistic models;
- Conception, development and implementation of a biphasic practice methodology: teleological and autotelic practice;
- Development of an original analytical approach termed 'aspect analysis'.

6.3 SIGNIFICANCE AND IMPACT

Since undertaking this research project I have released two CDs, signed to US-based record label *Fretmonkey Records*, toured in Europe, UK and USA as a solo performer and founded an ensemble specifically as a vehicle for the exploration of the themes in this thesis. My first CD *Departure* was released at the beginning of the research process and demonstrates the vocabulary I had developed as a solo contemporary fingerstyle guitarist. It was reviewed by *Acoustic Magazine* who said "[…] his mastery of the guitar is consummate, a bewilderingly complex mix of harmonics and tapping underlying a haunting modal instrumental." [17]

Since then, I have performed as a solo artist across the globe and been a regular on the global 'guitar night' circuit including performances in Berlin, Prague, Edinburgh, Galway as well as my own night; the Belfast Guitar Night.

My ensemble, Dionys Ensemble, recorded our first CD *Orchard* in May 2019 for inclusion in this submission. We have since played throughout Ireland, and been invited to tour in China in December 2019.

There is also the impact of the methodological approach, the application of which has the potential to go beyond the singular use in this thesis. It may be useful, not just to improvising musicians, but to many creative artists seeking to develop their skills and creativity.

Finally, from conversations with other researchers, it seems that *aspect analysis* could have significant utility for those working on similar projects to this one. Its potential for adaptability and comprehensiveness could provide analytical solutions to those currently constrained by more conventional approaches.

6.4 FUTURE RESEARCH

The scope of this thesis was confined to contemporary fingerstyle guitar. Therefore further research could take the form of applying the methodology to other musical contexts such as contemporary classical performance and contemporary jazz – any idiom that allows for degrees of improvisation. Outside of music it's easy to see how the methodology could be applied to other areas of creative arts practice such as visual arts, dance and drama. Further, it seems that a biphasic approach structured in a roughly teleological-autotelic format could have applications outside of the arts.[18]

---

[17] Magazine excerpt available at: http://garylutton.com/acoustic-magazine-cd-ft-gary-lutton/

In terms of my own practice, I would like to continue developing and assimilating new vocabulary using the biphasic approach to practice. I would also be interested in collaborating with psychological researchers to carry out experimental research relating to the biphasic approach. Of particular interest would be the relationship between flow and music improvisation practice (i.e. the development of improvisational skills), of which almost no literature was found by the researcher. Further collaborative projects could include devising biphasic practice methodologies for other idioms and practices.

---

[18] For instance, Taleb's (2012) notion of a *barbell strategy: "*a combination of two extremes, one safe and one speculative, deemed more robust than a "monomodal" strategy" (p.428)

7 BIBLIOGRAPHY

Araújo, M.V., Hein, C.F. (2016). 'Finding Flow in Music Practice: An Exploratory Study About Self-Regulated Practice Behaviours and Dispositions to Flow in Highly Skilled Musicians' in Harmat, Andersen, Ullén, Wright, Sadlo (Eds.), *Flow Experience. Empirical Research and Applications*. (pp. 23-36), Springer International Publishing.

Bailey, D. (1993). *Improvisation: Its Nature and Practice in Music*. DaCapo Press

Bennet, A. and Dawe, K. (eds.) (2001). *Guitar Cultures*. Oxford and New York: Berg

Bensusan, P. (1987). *The Guitar Book*. Hal Leonard

Berkowitz, A. (2010). *The Improvising Mind: Cognition and Creativity in the Musical Moment.* Oxford, UK: Oxford University Press.

Berliner, P. F. (1991). *Think in Jazz: The Infinite Art of Improvisation*. Chicago and London: The University of Chicago Press.

Bruya, B. (2010). 'Introduction: Toward a Theory of Attention and That Includes Effortless Attention and Action' in B. Bruya (Ed.) *Effortless Attention: A New Perspective in the Cognitive Science of Attention and Action*, Cambridge, MA: The MIT Press.

Butković, A., Ullén, F., Mosing, M.A. (2014). 'Personality related traits as predictors of music practice: Underlying environmental and genetic influences', *Personality and Individual Differences*, vol. 74, pp. 133-138.

Castle, J. (1971). *Deluxe Album of Classical Guitar Music*. Mel Bay Publications.

Chaffin, R., Imreh, G., & Crawford, M. (2012). *Practicing Perfection: Memory and Piano Performance*. East Sussex, UK: Psychology Press.

Chase, M.P. (1974). *Just Being at the Piano*. Culver City, CA: Peace Press, Inc.

Chase, W. G. & Simon, H. A. (1973). 'Perception in Chess', *Cognitive Psychology,* vol. 4, no. 1, pp. 55-81.

Clayton, M. (2000). *Time in Indian Music: Rhythm, Metre, and Form in North Indian Rāg Performance.* Oxford, UK: Oxford University Press

Cook, N. (1987). *A Guide to Musical Analysis.* Oxford, UK: Oxford University Press

Crook, H. (1999). *Ready, Aim, Improvise: Exploring the Basics of Jazz Improvisation.* Mainz: Advance Music

Cseh, G. M. (2016). 'Flow in Creativity: A Review of Potential Theoretical Conflict' in Harmat, Andersen, Ullén, Wright, Sadlo (Eds.), *Flow Experience. Empirical Research and Applications.* (pp. 79-94), Springer International Publishing.

Csikszentmihalyi, M (1975). *Beyond Boredom and Anxiety: Experiencing Flow in Work and Play*, San Francisco: Jossey-Bass Publishers.

Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience*: HarperCollins.

Csikszentmihalyi, M. (1998). 'Musical improvisation: A systems approach', in Sawyer, R. K. (Ed.) *Creativity in performance,* (pp. 43-66). US: ABC-CLIO

Csikszentmihalyi, M. (1998). *Finding Flow: The Psychology of Engagement With Everyday Life.* Basic Books

Csikszentmihalyi, M. (2002). *Flow: the Classic Work on How to Achieve Happiness.* USA: Rider.

Csikszentmihalyi, M. (2013). Creativity: The Psychology of Discovery and Invention, Harper Perennial

Csikszentmihalyi, M. (2014). 'Motivation and Creativity: Towards a Synthesis of Structural and Energistic Approaches to Cognition' in *Flow and the Foundations of Positive Psychology*, (pp. 155-173). (Reprinted from New Ideas in Psychology, 6(2), 159-176. 1988).

Csikszentmihalyi, M. (2014). 'Play and Intrinsic Rewards' in *Flow and the Foundations of Positive Psychology*, (pp. 135-154). (Reprinted from Journal of Humanistic Psychology, 15(3), 1975).

Csikszentmihalyi, M. and Csikszentmihalyi, I. S. (Eds.). (1988). *Optimal Experience: Psychological studies of flow in consciousness.* NY, USA: Cambridge University Press.

Czerny, C. (1983). *A Systematic Introduction to Improvisation on the Pianoforte.* Translated and edited by Alice L. Mitchell. New York: Longman Inc. (Originally published 1836).

Dann, E. (1968) *Heinrich Biber and the Seventeenth Century Violin.* PhD Thesis, Columbia University.

Davis, S. (2006). 'Implied Polyphony in the Solo String Works of J. S. Bach: A Case for the Perceptual Relevance of Structural Expression' in *Music Perception,* vol. 23(5), pp. 423-446.

De Grassi, A. (2012). *The Alex de Grassi Fingerstyle Guitar Method.* CA, USA: Stringletter, Inc.

Dietrich, A. (2004). 'Neurocognitive mechanisms underlying the experience of flow', *Consciousness and Cognition,* vol. 13(4), pp. 746-761.

Dietrich, A., Stoll, O. (2010). 'Effortless Attention, Hypofrontality and Perfectionism' in B. Bruya (Ed.) *Effortless Attention: A New Perspective in the Cognitive Science of Attention and Action*, Cambridge, MA: The MIT Press.

Doidge, N. (2007). *The Brain that Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science.* Penguin Books Ltd.

Dolan, D, Sloboda, J. Jensen, J. H. Crüts, B, Feygelson, E. (2013). 'The improvisatory approach to classical music performance: An empirical investigation into its characteristics and impact' in *Music Performance research*, vol. 6, pp. 1-38.

Elsdon, P. (2008). 'Style and the Improvised in Keith Jarrett's Solo Concerts' in *Jazz Perspectives*, vol.2(1), pp. 51-67

Elsdon, P. (2013). 'Re-imagining Improvisation: Listening, Discourse and Aesthetics.' Accessed at: https://www.academia.edu/4008279/Re-imagining_Improvisation_Listening_Discourse_and_Aesthetics (Accessed 03/09/2019)

Ericsson, A. & Pool, R. (2016). *Peak: Secrets from the New Science of Expertise.* London, UK: The Bodley Head.

Ericsson, A.K., Krampe, R.T., Tesch-Römer, C. (1993). 'The Role of Deliberate Practice in the Acquisition of Expert Performance' in *Psychological Review*, vol. 100(3), pp. 363-406.

Eysenck, M.W., Keane, M.T. (2005). *Cognitive Psychology: A Student's Handbook.* East Sussex, UK: Psychology Press Ltd.

Garcia, A. L. (2014). *Stringshift: Solo Guitar Improvisation: Process, Methodology and Practice.* PhD thesis, University of Tasmania.

Goldman, A. (2012). 'What does one know when one knows how to improvise?', *12th Annual Conference on Music Perception and Cognition,* July 23-28, Thessaloniki, Greece, pp. 360-368.

Goldman, A. (2013). 'Towards a cognitive–scientific research program for improvisation: Theory and an experiment' in *Psychomusicology: Music, Mind, and Brain*, vol. 23(4), pp. 210-221

Greene, B. (2004). *Advanced Jazz Guitar Improvisation.* USA: Mel Bay Publications.

Gunaratana, B. H. (2002). *Mindfulness in Plain English.* Somerville, MA: Wisdom Publications.

Haseman, B. (2010). 'Rupture and Recognition: Identifying the Performative Research Paradigm' in Barrett, E. & Bolt, B. (Eds.) *Practice as Research: Approaches to Creative Arts Enquiry*, I.B. Tauris & Co. Ltd.

Hedges, M. & Stropes, J. (1995). *Rhythm, Sonority, Silence.* WI, USA: Stropes Editions Ltd.

Herrigel, E. (1953). *Zen in the Art of Archery. London*, England: Penguin Books Ltd.

Heutte, J., Fenouillet, F., Kaplam. C.M., Bachelet, R. (2016). 'The EduFlow Model: A Contribution Toward the Study of Optimal Learning Environments' in Harmat, Andersen, Ullén, Wright, Sadlo (Eds.), *Flow Experience. Empirical Research and Applications.* (pp.127-144), Springer International Publishing.

Holland, J. (1998). *Emergence: From Chaos to Order,* MA, USA: Addison-Wesley Publishing Company, Inc.

Hytönen-Ng, E. (2016). *Experiencing 'Flow' in Jazz Performance.* New York, NY: Routledge.

Jackson, S.A., Martin, A.J., & Eklund, R.C. (2008). 'Long and short measures of flow: Examining construct validity of the FSS-2, DFS-2, and new brief counterparts' in *Journal of Sport and Exercise Psychology*, vol. 30, pp. 561-587.

Järilehto, L. (2016). 'Intuition and Flow' in Harmat, Andersen, Ullén, Wright, Sadlo (Eds.), *Flow Experience. Empirical Research and Applications.* (pp. 95-104), Springer International Publishing.

John-Steiner, V., Mahn, H. (1996). 'Sociocultural Approaches to Learning and Development: A Vygotskian Framework' in *Education Psychologist*, vol. 31, pp. 191-206.

Johnson-Laird, P. N. (2002). 'How Jazz Musicians Improvise', in *Music Perception: An Interdisciplinary Journal*, vol. 19(3), pp. 415-442.

Kahneman, D. (2011). *Thinking Fast and Slow.* Penguin Books

Klickstein, G. (2009). *The Musician's Way: A Guide to Practice, Performance, and Wellness.* New York, NY: Oxford University Press.

Leonard, G. (1992). *Mastery.* New York, NY: Penguin Books USA Ltd.

Maslow, A.H. (1962). Lessons from the Peak-Experiences. Accessed at: http://journals.sagepub.com/doi/pdf/10.1177/002216786200200102 (accessed: 04/09/19).

McKnight, M. (2012). *Contemporary jazz guitar performance: perspectives on the development of improvisational language.* PhD thesis, University of Ulster.

Mermikides, M. (2010). *Changes Over Time: Theory: The theoretical modelling, analysis and redeployment of jazz improvisational, and time-feel, mechanisms.* PhD thesis, University of Surrey.

Nachmanovitch, S. (1991). *Free Play: Improvisation in Life and Art.* NY, USA: Penguin Putnam Inc.

Nettl, B. (1974). 'Thoughts on Improvisation: A Comparative Approach' in *The Musical Quarterly*, vol. 60(1), pp. 1-19.

Nettl, B. and Russell, M. (eds.) (1998). *In the Course of Performance: Studies in the World of Musical Improvisation.* University of Chicago Press.

Norgaard, M. (2011). 'Descriptions of Improvisational Thinking by Artist-Level Jazz Musicians' in *Journal of Research in Music Education,* vol. 59(2), pp. 109-127

Norgaard, M. (2014). 'How Jazz Musicians Improvise: The Central Role of Auditory and Motor Patterns', *Music Perception: An Interdisciplinary Journal*, vol. 31(3), pp. 271-287.

Park, J. H., & Shea, C. H. (2003a). 'The effects of practice on effector transfer' in *Journal of Motor Behavior*, vol. 35, pp. 33–40.

Peterson, J. B. (1999). *Maps of Meaning: The Architecture of Belief.* New York, NY: Routledge.

Posner, M.I. Rothbart, M.K., Rueda, M.R., Tang, Y. (2010). 'Training Effortless Attention' in B. Bruya (Ed.) *Effortless Attention: A New Perspective in the Cognitive Science of Attention and Action* (pp. 410-424). Cambridge, MA: The MIT Press.

Pressing, J. (1984). 'Cognitive Processes in Improvisation', in *Advances in Psychology,* vol. 19, pp. 345-363.

Pressing, J. (1987) 'Improvisation: Methods and Models' in Sloboda, J. (Ed.) *Generative processes in Music*: Oxford University Press

Pressing, J. (1998). 'Psychological Constraints on Improvisational Expertise and Communication' in Nettl, B. & Russell, M. (Eds.) *In the Course of Performance: Studies in World of Musical Improvisation.* University of Chicago Press, pp. 47-67.

Pressing, J., 1998. 'Psychological constraints on improvisational expertise and communication' in Nettl, B., Russell, M. (Eds.), *In the Course of Performance: Studies in the World of Musical Improvisation.* (pp. 47–68), Chicago and London: University of Chicago Press.

Roche, E. (2004). *The Acoustic Guitar Bible.* Sanctuary Publishing Ltd.

Rojas, A. (2014). *Michael Hedges Interview – Aerial Boundaries*, Accessed at: https://www.youtube.com/watch?v=6kJ-G8GW0UA&ab_channel=Andr%C3%A9sRojas (Accessed 03/09/2019).

Rolleston, T. W. (1990). *Celtic Myths and Legends.* Dover publications. (Original work published 1911).

Sadlo, G. (2016). 'Towards a Neurobiological Understanding of Reduced Self-Awareness During Flow: An Occupational Science Perspective' in Harmat, Andersen, Ullén, Wright, Sadlo (Eds.), *Flow Experience. Empirical Research and Applications.* (pp. 375-388), Springer International Publishing.

Sawyer, K. (1992). 'Improvisational creativity: An analysis of jazz performance' in *Creativity Research Journal*, vol. 5(3), pp. 253-263.

Sawyer, K. R. (2012.) *Explaining Creativity: The Science of Human Innovation.* Oxford University Press.

Sawyer, K. R. (ed.) (1998) *Creativity in performance*, Praeger .

Schmeichel B. J., Baumeister R. F. (2010). 'Effortful attention control' in B. Bruya (Ed.) *Effortless Attention: A New Perspective in the Cognitive Science of Attention and Action*. (pp. 29-49) Cambridge, MA: The MIT Press.

Schmidt, R. A. (1975). 'A Schema Theory of Discrete Motor Skill Learning' in *Psychological Review,* vol. 82(4), pp. 225-260.

Schmidt, R. A. & Lee, T. D. (2005). *Motor Control and Learning: A Behavioral Emphasis.* IL: USA: Human Kinetics.

Shea, C. H. & Wulf, G. (2005). 'Schema Theory: A Critical Appraisal and Reevaluation', in *Journal of Motor Behavior,* vol. 37(2), pp. 85-101.

Sinclair, R. (2007). *Acoustic Guitar Practice and Acousticity: Establishing Modalities of Creative Practice*, PhD. Thesis, Newcastle University, Newcastle.

Sinnamon, S., Moran, A., O'Connell, M., (2012). 'Flow Among Musicians: Measuring Peak Experiences of Student Performers' in *Journal of Research in Music Education,* vol. 60(1), pp.6-25.

Taleb, N. N. (2013). *Antifragile: Things that Gain from Disorder.* London, UK. Penguin Books.

Towner, R. (1985). *Improvisation and Performance Techniques for Classical and Acoustic Guitar.* Accessed at: http://valdez.dumarsengraving.com/ralph.towner.pdf (Accessed 03/09/19).

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Watts, A. (1975). *Tao: The Watercourse Way.* London, UK: Souvenir Press Ltd.

Werner, K. (1996). *Effortless Mastery: Liberating the Master Musician Within.* New Albany, IN: Jamey Aebersold Jazz.

Whittam, J. (2013). 'Music, Multimedia and Spectacle: The one-man-band and audience relationship in a digital age' Accessed at: http://www.creationsonore.ca/wpcontent/uploads/2014/10/travaux_julian-whittam_music-multimedia-and-spectacle.pdf (Accessed 03/09/19).

Whouston33wh, (2012), *Michael Hedges on The Artists Profile (Full)*. Accessed at: https://www.youtube.com/watch?v=kBPKmyH1f2w&ab_channel=whouston33wh (Accessed 03/09/2019)

Wilhelmsen, C. (n.d.) 'Flow and Music Therapy Improvisation: A Qualitative Study of Music Therapists' Experiences of Flow During Improvisation In Music Therapy'. Accessed at: https://core.ac.uk/download/pdf/30898557.pdf (Accessed 03/09/19)

Williams, T. (2017). *Strategy in contemporary jazz improvisation : theory and practice.* PhD thesis, University of Surrey.

Wulf, G., & Lewthwaite, R. (2010). 'Effortless motor learning?: An external focus of attention enhances movement effectiveness and efficiency' in B. Bruya (Ed.) *Effortless Attention: A New Perspective in the Cognitive Science of Attention and Action.* (pp. 75-101) Cambridge, MA: The MIT Press.

York, A. (2011). *The Classical Guitarist's Guide to Jazz.* CA, USA: Alfred Music Publishing Co., Inc.

Zadeh, C. (n.d.) Formulas and the Building Blocks of Thumri Style – A Study in "Improvised" Music. Accessed at: http://www.aawmjournal.com/articles/2012a/Zadeh_AAWM_Vol_2_1.htm (Accessed 03/09/19)

Zonis, E. (1973). *Classical Persian Music: An Introduction,* Harvard University Press

8 DISCOGRAPHY

Bensusan, P. (2009). *Intuite* [CD] Dadgad Music.

Hedges, M. (1984). *Aerial Boundaries* [CD] Sony Music Cmg.

Jarrett, K. (2008). *The Köln Concert.* [CD] ECM Records.

Jarrett, K. (1973). *Solo concerts: Bremen/Lausanne* [CD] ECM Records.

Leeb, T. (2006). *Upside Down* [CD]

Leeb, T. (2007). *Desert Pirate* [CD]

Leeb, T. (2015). *Trickster* [CD]

Metheny, P. (2003). *One Quiet Night* [CD] Warner Bros.

Towner, R. (2017). *My Foolish Heart* [CD] ECM Records.