The University of Adelaide

Elder Conservatorium of Music

Faculty of Arts

Megan Anne Robson

Scordatura on the Classical Guitar: Implications for Practice and Performance

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Principal supervisor: Dr. Oliver Fartach-Naini

Co-supervisor: Mr. Stephen Whittington

TABLE OF CONTENTS

ABSTRACT

This performance-based project explores how scordatura (alternate tuning) challenges practice and performance on the classical guitar. A range of scordatura works have been examined to identify what adjustments can be made in practice and performance to facilitate a coherent recital. By analysing curatorial and repertoire–specific challenges, this project aims to explore the impacts scordatura has on established auditory, cognitive, kinaesthetic and visual processes. These aspects will be brought into more specific focus through four case studies: Lilith Guégmian's *Dans le Souffle du Temps*, Bryan Johanson's *A Dog from Every Town*, Gary Ryan's *Out of Clonmel* and Richard Charlton's *Sonata of Forgotten Dreams*. The project culminates in two one-hour recitals and an accompanying 7,500-word exegesis.

DECLARATION

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Megan Robson

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LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Scordatura is most commonly defined as an abnormal tuning of a string instrument to obtain a special effect, a practice found in early developments of instruments and performance.[1] As identified by Theodore Russell, the use of scordatura has three common aims: to make certain passages easier to play, to vary tone colour, and to extend the range of the instrument.[2]

While scordatura allows for a range of new sonic possibilities to be explored on the classical guitar, its use can impact a variety of established skillsets involved in both practice and performance. From the initial read-through of a scordatura work, the guitarist is required to navigate a variety of alterations that affect their auditory, cognitive, kinaesthetic and visual processes. Aspects such as decoding varying methods of notation, adapting or even re-establishing a mental map of the fretboard and understanding the new relationships between visual cues and auditory expectations can prolong and complicate the practice process. The use of scordatura can also affect the performance experience itself. For example, the more strings that are altered between pieces the higher the possibility that the instrument will go out of tune. Additionally, when pieces that require numerous tuning changes are programmed consecutively, maintaining tuning accuracy becomes increasingly challenging.

To better understand and mitigate potential practice and performance challenges associated with the use of scordatura, this exegesis examines a variety of pieces that utilise alternate tunings. Challenges will be identified through practice and discussed through four case studies to examine how each unique tuning alters practice for performance and the performance itself. By conducting practice-led research, this exegesis aims to address issues such as adaptations to established processes of music learning processing systems, what practice adjustments can be beneficial, as well as curatorial considerations for programmes involving scordatura works. The ensuing discussion of these challenges will be guided by the following aims and questions.

[1] Michael Kennedy, Joyce Kennedy and Tim Rutherford-Johnson, "Scordatura" in *The Oxford Dictionary of Music,* Sixth edition (Oxford: Oxford University Press, 2012).
[2] Theodore Russell, ""The Violin" Scordatura", *The Musical Quarterly 24, no. 2 (1938):* 84.

Aims of Study

The aims of this performance-based project are:

1. To curate and produce audio-visual recordings of two 60-minute live recitals featuring contemporary classical guitar works (1983–2023) that use scordatura.
2. To understand auditory, cognitive, kinaesthetic and visual challenges that scordatura imposes on practice and performance for the classical guitarist.
3. To identify practice adjustments that are required for compositions utilising scordatura.
4. To establish approaches to practice that can be used across various scordatura settings.

Research Questions

The research questions of this performance-based project are:

1. What are the key considerations needed for the curation of a cohesive recital programme of scordatura compositions?
2. How does scordatura have an impact on auditory, cognitive, kinaesthetic and visual processes?
3. What sort of practice adjustments are required for works using scordatura?
4. Can a deeper understanding of scordatura tuning—beyond the learning of only one such piece—inform practice for performance?

Theoretical Framework

There are three interconnected processes underpinning this project: practice-led research, research-led practice, and academic research (literature and score analysis). As proposed by Smith and Dean this iterative cyclic web is proposed to facilitate movement between processes in a framework. [3] Within the context of this project, the iterative cycle will begin with repertoire selection and practice, leading to an outcome (understanding of the scordatura). This outcome can then be analysed to inform the next stage of practice. Based on the objectives listed above, this research will consist of source collection and analysis, practice-based research and research-based practice, culminating in live recital recordings.

[3] Hazel Smith and Rodger T. Dean, "Introduction: Practice-led Research, Research-led Practice – Towards the Iterative Cyclic Web". In *Practice-led Research, Research-led Practice in the Creative Arts*, ed. by H. Smith and R. T. Dean, Edinburgh University Press, 2009, 1-36.

PART ONE: AUDIO-VISUAL RECORDINGS

Recital One: Elder Hall, Friday, October 14th, 2022

Composer	Piece	Tuning	Timestamp
Richard Charlton	Sonata of Forgotten Dreams (2015)	E-G$^{\#}$-c$^{\#}$-g-b-e’	00:24
Lilith Guégamian	Dans le Souffle du Temps (2021)	E-A-c$^{\#}$-g$^{\#}$-b-e’	20:55
Carlo Domeniconi	Koyunbaba (1985)	C$^{\#}$-G$^{\#}$-c$^{\#}$-g$^{\#}$-c$^{\#}$’-e’	28:05
Marián Budoš	Southern Cross (1996)	C-A-c-g-c’-e’	45:21
			Total: 54:52

Table 1: Recital one repertoire, with timestamps.

Recital Two: EMU Studio, Thursday, March 30th, 2023

Composer	Piece	Tuning	Timestamp
Marián Budoš	I. Labantina (1997)	F-A-c-g-a-e’	00:31
James Rawley	Rosella (2016)	F-A-d-g-b-e’	04:35
Phillip Houghton	Kinkachoo, I Love You (1998)	F-A-d-g-b-e’	09:12
	God of the Northern Forest (1989)	F-A-d-g-b-e’	12:04
	Ophelia (2004)	E^{b}-G-d-g-b-e’	18:11
	Intermission		28:50
Bryan Johanson	A Dog from Every Town (2013)	D^{b}-A^{b}-c-f-a^{b}-d’	29:29
Bruce Paine	Tarakihi (2019)	C-G-d-f-a^{b}-d’	36:38
Gary Ryan	Out of Clonmel (2008)	D-A-d-f$^{\#}$-a-d’	41:44
Jack Daws	Greenglade (2023)	D-A-d-f$^{\#}$-b-e	46:26
Gary Ryan	Lough Caragh (2008)	D-A-d-g-b-e’	52:12
Andrew York	Sunburst (1986)	D-A-d-g-b-d’	58:56
			Total: 62:55

Table 2: Recital two repertoire, with timestamps.

PART TWO: EXEGESIS

Chapter 1: Literature Review and Key Concepts

1.1. Literature Review

Scordatura tunings for the present-day classical guitar echo the varied tunings of its predecessors, namely the four and five-course guitars, the lute, and the vihuela. The tunings of these instruments would be regularly altered to facilitate a wider range of keys and allow for certain chords to be played with greater ease.[4] Stemming from these flexible approaches to tuning, the modern-day classical guitar commonly utilises the tunings of drop D (D-A-d-g-b-e'), drop D/G (D-G-d-g-b-e') or the F# tuning (E-A-d-f#-b-e') often used for lute repertoire.[5] Aside from the use in new compositions, another common use of scordatura on the classical guitar has been to facilitate playable arrangements of compositions for other string instruments, such as the cello works of Johann Sebastian Bach and lute works of John Dowland.[6]

To imitate the sonority of the lute on the guitar, Renato Serrano explores the tunings of D-minor (D-A-f-a-d-f') and C-minor (C-G-d-g-c-e^{b}') to perform Silvius Leopold Weiss' Sonata 36.[7] Not surprisingly, Serrano comments on the difficulty of reading a piece increasing with every additional pitch alteration, namely the implication on the performer's ability to identify and negotiate effective fingering solutions. Serrano employs lute tablature below the standard guitar notation to help the guitarist gain a deeper understanding of fingering.[8] However, unless the guitarist has previously studied early music, lute tablature serves more as a historical artifact than a practical fingering guide. Nevertheless, the use of notation styles utilising a prescriptive element will be looked at as possible ways to facilitate learning and referencing pitches more effectively.

Following on from Serrano, a theme that permeates the available literature on scordatura is the discussion of notation styles. Cellist Nathan Cook labels the two most

[4] Harvey Turnbull, *The Guitar from the Renaissance to the Present Day*, (London: Batsford Ltd, 1974), 11-13.
[5] Pitches here are listed from low to high (sixth string to first string).
[6] Bin Hu, "An Exploration into the Use of Scordatura Tuning to Perform JS Bach's Partita BWV 1004 on the Guitar" (PhD Diss, the University of Arizona, 2019).
[7] Renato Serrano, "Guidelines for Transcribing Baroque Lute Music for the Modern Guitar, Using Silvius Leopold Weiss's Sonata 36 (From the Dresden Manuscript) as a Model" (DMA Diss., University of Arizona, 2016), 31-46
[8] Ibid, 45

common as either ‘at-pitch’ or ‘as-fingered’.[9] At-pitch notation specifies the sounding pitches. As acknowledged by Josel and Tsao, this is most commonly used in repertoire where only one or two strings have been altered.[10] Using at-pitch notation requires the player to re-learn how to finger the instrument on any altered strings thus requiring a recalibration of established processes.[11]

As-fingered notation, on the other hand, is a prescriptive style of notation that represents a note as it would be played in standard tuning with a specific finger on a specific string, rather than a specified pitch. Similar to the notation methods of other transposing instruments such as the clarinet and trumpet, ‘the intention is to maintain the relationship between notation and execution’.[12] Therefore the classical guitar is played as if the tuning of the instrument was unaltered, with each altered string being treated as a transposing instrument.[13] This is why Cook warns that as-fingered notation may lead to confusion as pitches and intervals heard can be inconsistent with what is seen on the page.[14]

In addition to notation styles that utilise only one stave, many composers make use of a hybrid style of notation. As Mieko Kanno explains, prescriptive approaches to notation are often paired with 'resultant notation' as it provides a clear instruction manual, guiding the performer to the intended sonic outcome.[15] In the case of this present study, this encompasses pairing at-pitch notation with tablature or as-fingered notation. The hybrid notation solution presented by Cook is presented in the form of individual ossia bars written in as-fingered notation, accompanying the main at-pitch stave. Alternatively, Josel and Tsao recommend transposing the notation as if it were in standard tuning, adding a small upper stave for the true sounding pitches.[16] From these authors we can identify four common styles of notation: at-pitch, as-fingered, hybrid at-pitch/tablature and hybrid at-pitch/as-fingered.[17]

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[9] Nathan Cook, “Scordatura Literature for Unaccompanied Violoncello in the 20th Century: Historical Background, Analysis of Works, and Practical Considerations for Composers and Performers” (DMA Diss, Rice University, 2005).
[10] Seth F. Josel, Ming Tsao, *The Techniques of Guitar Playing* (Basel: Bärenreiter, 2014), 23.
[11] Cook, 99.
[12] Anthony C. Baines and Janet K. Page, “Transposing instruments”. Grove Music Online. 2001.
[13] Due to its notation being one octave higher than it sounds, the guitar is already a transposing instrument. However, this is much easier to reconcile than the inconsistent interval transposition required for scordatura works.
[14] Cook, 99.
[15] Mieko Kanno, “Prescriptive notation: Limits and Challenges”. *Contemporary Music Review* 26, no. 2 (2007), 235.
[16] Josel and Tsao, 23.
[17] This does not include the use of tablature alone or the unusual case of Domeniconi’s *Koyunbaba* where his at-pitch/as-fingered hybrid scoring refers to a guitar in D-minor tuning (D-A-d-a-d’-f’) although the suggested performance tuning is an open C-sharp-minor tuning (C#-G#-c#-g#-c#’-e’).

The above discussion illustrates that scordatura can create a number of cognitive dissonances. To help alleviate some of these dissonances, perceptual models such as the visual-auditory-kinaesthetic (VAK) learning styles model can be utilised to better understand how we can efficiently interact with, perceive and retrieve information.[18] Since practicing and performing music is a multimodal activity that actions cognitive, visual, auditory and kinaesthetic regions simultaneously, using the VAK styles model can allow guitarists to recognise their preferred learning styles and how these preferences relate to learning and understanding scordatura works.

The VAK model is discussed by Aiello and Williamon, through the lens of memory.[19] Visual memory is made up of images from the written page as well as other visual aspects of the environment such as the placement of fingers on strings and patterns across the fretboard as they are played. Auditory memory enables individuals to internally hear a piece, anticipate upcoming events in the score, and evaluate performance progress simultaneously. Kinaesthetic memory enables performers to execute complex motor systems automatically.

A key component of this is highlighted by Gottfried Schlaug who comments that 'instrumentalists learn and repeatedly practice associating hand/finger movements with meaningful patterns in sound, and sounds and movements with specific visual patterns (notation)'.[20] By continuously integrating a variety of sensory information, musicians are able to map auditory-kinaesthetic connections, classify individual auditory events, and predict and recognize changes in musical sequences.[21] Using these predictions and expectations, Rohrmeier and Koelsch explain that musicians are able to predict harmonic and melodic content, expediting the practice process.[22] In contrast, it is these predictions that become so much more challenging in the context of scordatura.

Similarly, Altenmüller and Furuya, discuss how musicians continuously draw on established sets of complex skills by consolidating multisensory information.[23] These

[18] Jehad Ali Almomani, "Preferred Cognitive Learning Patterns (VAK) Among Secondary Students Admitted to King Saud University and its Effect on their Academic Achievement in Physics", *International Education Studies* 12, No. 6 (2019): 108-113.
[19] Rita Aiello and Aaron Williamon, "Memory", in *Oxford handbook of Music Psychology,* ed. Susan Hallam, Ian Cross and Michael Thaut, (Oxford University Press, 2011), 167-181.
[20] Gottfried Schlaug, "Music, Musicians and Brain Plasticity" in *Oxford handbook of Music Psychology,* ed. Susan Hallam, Ian Cross and Michael Thaut, (Oxford University Press, 2011), 204-205.
[21] Ibid, 199-200.
[22] Martin A. Rohrmeier, Stefan Koelsch, "Predictive information processing in music cognition. A critical review", *International Journal of Psychophysiology* 83, No.2 (2012): 164-175.
[23] Eckart Altenmüller and Shinichi Furuya. "Apollos Gift and Curse: Making Music as a model for Adaptive and Maladaptive Plasticity " *e-Neuroforum* 23, no. 2 (2017): 57-75.

processes allow neural circuits to better connect auditory, visual, and kinaesthetic regions of the brain, becoming better connected, stronger and faster the more they are used. This is because myelin proteins insulate nerve fibres, allowing for information to travel faster and be stored more efficiently between different regions of the brain and body.[24] The more insulated the pathways become, the more automatic the process of decoding and performing of music becomes.[25] In order for guitarists to adapt these processes for learning scordatura works a level of cognitive plasticity is required as it allows for guitarists to reorganise, build and myelinate new multisensory pathways.

To begin to reorganise and build pathways required for scordatura, Lee Jones discusses plasticity in relation to kinaesthetic processes. Jones describes how kinaesthetic memory becomes an 'inevitable by-product of constant practice' and is a necessary skill for sight-reading.[26] Consequently, each scordatura setting requires the performer to create new connections and strengthen less developed neural pathways. In the case of sight-reading, the lower literacy levels for a particular tuning are, the slower the respective auditory, visual, and kinaesthetic processes become. When combined with scordatura, kinaesthetic memory will undergo a series of recalibrations as established finger patterns will 'sound completely different due to the resultant change of (string) pitches' and intervals between strings.[27]

To understand how pathways can be built or adapted, we can look to Addie Johnson's stages of skill acquisition.[28] The first stage begins with 'declarative memory' which is heavily dependent on comprehending instructions and feedback. This is followed by the second stage of 'association' where pattern recognition is supported by continuous practice. Finally, the 'autonomous' stage, where the performance of the skill is at large free from errors and cognitive resistance.[29] Further to this, Johnson defines the autonomous stage as transitioned from relying on verbal, declarative knowledge to relying on procedures and routines for performing a task.[30] By utilising procedural memory performers are able to better retain connections between stimuli and responses and can

[24] Ibid, 59.
[25]Donald J. Walter and Jennifer S. Walter, "Skill Development How Brain Research Can Inform Music Teaching", *Music Educators Journal* 101, No 4 (June 2015): 51-52.
[26] Lee Anthony Jones, "Exploration of unorthodox tunings and muscle memory practice for the electric guitar." (PhD Diss., University of Salford, 2019), 19.
[27] Ibid, 20.
[28] Addie Johnson, "Procedural Memory and Skill Acquisition" in *Handbook of Psychology, Experimental Psychology* (New Jersey: John Wiley & Sons, Inc, 2013), 495-515.
[29] Ibid, 496.
[30] Johnson, 502.

overlay the knowledge in similar settings. This is particularly useful in the context of this project as it allows guitarists to build a series of expectations that can be applied across a range of scordatura works. For example, A guitarist who is already familiar with drop D will find it much easier to play drop D/G pieces since they can rely on their knowledge of the sixth string and concentrate on the newly altered fifth string.

The link between procedural memory and skill acquisition is also discussed by Gupta and Cohen, who agree that the automaticity of procedural memory occurs 'gradually, as a result of practice over many exposures.'[31] These authors state that 'performance on non-repeating stimuli will necessarily be inferior, because the connection weights have not undergone repeated tuning towards these stimuli'. In the context of this exegesis, we can begin to understand the correlation between alternate tuning and extended time learning, especially given that consistent repetition is necessary for automaticity.

Another challenge of scordatura comes from what we hear. As Edwin Gordon highlights, musicians develop the ability to internally hear the notes on the page away from the instrument, known as 'audiation'.[32] 'Audiation is to music what thought is to language' and relies on imitation, memory and recognition built on well-myelinated pathways. This allows musicians to interpret visual, melodic and harmonic material before it is played on the instrument.[33] In conjunction with the visual aspect of scordatura notation, this process can be challenged as the recognition and memory of visual elements are inconsistent with what is played and heard. This requires guitarists to recalibrate their auditory systems as while techniques and fundamental skills remain the same, the resultant sounds can be drastically altered.

In order to address the much-discussed need to update our visual, cognitive, kinaesthetic, and auditory processes, guitarists therefore need to consider how practice can be adapted to meet the demands of the repertoire. As stated by Barry and Hallam 'a key purpose of practice is to enable complex physical, cognitive, and musical skills to be performed fluently with relatively small conscious control'.[34] In order to do so the authors suggest using analysis (study of the score for keys, meters and patterns), metacognition

[31] Prahlad Gupta and Neal Cohen, "Theoretical and Computational Analysis of Skill Learning, Repetition Priming, and Procedural Memory", *Psychological Review* 109, No.2 (2002): 401-448.
[32] Edwin E. Gordon, "All About Audiation and Music Aptitudes": Edwin E. Gordon Discusses Using Audiation and Music Aptitudes as Teaching tools to Allow Students to Reach Their Full Music Potential", *Music Educators Journal* 86, No. 2 (1999): 41-44.
[33] Ibid, 42.
[34] Nancy Barry and Susan Hallam, "Practice", in The Science and Psychology of Music Performance, ed. Richard Parncutt and Gary McPherson (New York: Oxford University Press, 2002), 155.

(understanding personal strengths and weaknesses in relation to practice) and mental (visualising away from the instrument) practice strategies.[35] In this exegesis, the understanding of metacognition as it relates to the VAK model is especially relevant since it requires guitarists to identify their own practice preferences, inclinations, and deficiencies. This includes identifying whether the visual-auditory connection provided by an at-pitch stave, or the visual-kinaesthetic connection provided by a prescriptive approach promises to be more reliable to the guitarist.

Sam Cave suggests that we implement a series of exercises to secure note positions across the 'mind and body'.[36] In order to become familiar with the new positions of notes and harmonics, Cave suggests guitarists create exercises, arpeggios, and scales.[37] This can be utilised in each unique scordatura setting, creating single and cross string scales in at-pitch notation to identify new note positions, and can be used to alter auditory expectations in as-fingered notation and tablature. As the geographical relationship of a fretboard map changes, guitarists are able to adapt their relationship between their image of the movement, the physical gesture and the resulting sound.

From the literature examined above, key challenges have been identified such as the variety of notation styles, the consequent implications on auditory and kinaesthetic expectations and how cognitive systems are impacted. To begin addressing these in a practical context, through practice-led research and research-led practice, the following sections will discuss mental and physical practice approaches for learning scordatura repertoire.

[35] Barry and Hallam, 153-155.
[36] Sam Cave, "Riding the Wild Ocean: Horatiu Radulescu's *Subconscious Wave* In Theory, Performance and Recording" *Tempo 76*, no. 299 (2022): 30-43.
[37] Ibid, 37.

1.2. Curatorial Considerations

Scordatura in performance is likely to cause strings to 'creep' out of tune, creating a less than ideal experience for the audience and performer alike. Consequently, one aim of this project is to navigate the range of required tunings on one guitar in a way in which 'string creeping' is kept within manageable limits.

Therefore, the approach taken is to group the repertoire for both recitals around similar scordatura settings. As a result, the first recital only includes tunings that involve pitch changes to C-sharp, G-sharp or C-natural. Additionally, the sequencing of pieces was guided by the aim to lower or raise affected strings as gradually as possible. For the first recital tunings were sequenced to lead into *Koyunbaba,* the composition with the most significant deviation from standard tuning. By ensuring that at least one settled string remained unchanged, this provided a reference point for tuning adjustments. Although—when transitioning from *Koyunbaba* to *Southern Cross*—five strings needed to be changed by one semitone. Compared to establishing this scordatura setting coming from standard tuning, this allowed for the strings to hold pitch more reliably.

Accordingly, tuning changes during the second recital were also kept to a minimum. The first half of this recital was mostly limited to pieces where the sixth string is tuned up to F. *Labantina* and *Ophelia* are outliers in this aspect as *Labantina* lowered the second and fourth strings by a tone, and *Ophelia* departed from the raised F tuning altogether. Again, this allowed for the best possible tuning consistency, requiring only a few adjustments between pieces. Having the first, fourth, and sixth strings regularly tuned to D was helpful in this regard.

Recital One

Composer	Piece	Tuning (low to high)
Richard Charlton	Sonata of Forgotten Dreams (2015)	E-G$^{\#}$-c$^{\#}$-g-b-e'
Lilith Guégamian	Dans le Souffle Du Temps (2021)	E-A-c$^{\#}$-g$^{\#}$-b-e'
Carlo Domeniconi	Koyunbaba (1985)	C$^{\#}$-G$^{\#}$-c$^{\#}$-g$^{\#}$-c$^{\#}$'-e'
Marián Budoš	Southern Cross (1996)	C-A-c-g-c'-e'

Table 3: Recital one repertoire, tuning considerations.

Recital Two

Composer	Piece	Tuning (low to high)
Marián Budoš	Labantina (1997)	F-A-c-g-a-e’
James Rawley	Rosella (2016)	F-A-d-g-b-e’
Phillip Houghton	Kinkachoo, I Love You (1998)	F-A-d-g-b-e’
	God of the Northern Forest (1989)	F-A-d-g-b-e’
	Ophelia (2004)	E^{b}-G-d-g-b-e’
Bryan Johanson	A Dog from Every Town (2013)	D^{b}-A^{b}-c-f-a^{b}-d’
Bruce Paine	Tarakihi (2019)	C-G-d-f-a^{b}-d’
Gary Ryan	Out of Clonmel (2008)	D-A-d-$f^{\#}$-a-d’
Jack Daws	Greenglade (2023)	D-A-d-$f^{\#}$-b-e
Gary Ryan	Lough Caragh (2008)	D-A-d-g-b-e’
Andrew York	Sunburst (1986)	D-A-d-g-b-d’

Table 4: Recital two repertoire, with tuning considerations.

Recital key:
Green: the string is raised in pitch from the piece before
Red: the string is lowered in pitch from the string before
Black: the string remains unaltered from the piece before

Due to the tuning requirements of the recitals, practice was often structured by grouping pieces with similar tunings such as *Out of Clonmel, Greenglade* and *Lough Caragh.* Practicing with these tuning groups also provided more frequent opportunities for rehearsing ad hoc tuning adjustments required during the recitals. In addition to transitioning between pieces, it was critical to understand which strings were likely to detune in which direction during the performances. As a result, ample time was provided to understand where tuning deviated and to practice identifying and adjusting the tuning deficiencies in performance. An example of this is transitioning from *Dans le Souffle du Temps* into *Koyunbaba*. From practice it was identified that the sixth and second strings were the most likely to slip out of tune.

1.3. Key Concepts

1.3.1. Visual Aspects

Scordatura challenges a variety of interrelated processes, many of which begin with decoding the score. As discussed previously, there are numerous ways in which to notate scordatura works, of which the four most common styles of notation are at-pitch, as-fingered, at-pitch/tablature hybrid and at-pitch/as-fingered hybrid.

Scordatura pieces are commonly notated in at-pitch notation as it is easiest to comprehend from both a performance and compositional perspective. This is most commonly used when only one or two strings are altered. Because the pitch in the score is accurate to the pitch produced by the instrument, cognitive dissonance is reduced to managing fingering adjustments as visual-auditory connections are preserved. At-pitch notation also allows the guitarist to analyse melodic and harmonic content quickly and accurately as no transposition-related cognitive adjustments are required. However, by prioritising the visual-auditory circuits, the guitarist is required to transpose notes on the affected strings to determine their updated locations across the fretboard. This constant need for spatial adjustments will be discussed in more detail in the context of kinaesthetic aspects.

Conversely, as-fingered notation is commonly used when two or more strings have been altered, a system that prioritises the link between visual and kinaesthetic systems. Because of this, guitarists have access to their existing mental map of the fretboard allowing them to identify note placements quickly and accurately regardless of tuning. This method's success depends on the individual's familiarity with the fretboard and—importantly—the score's accuracy in terms of string and position indications. While this confirms ingrained kinaesthetic navigation, the relationship between visual and auditory processes is complicated as the sonic output of the instrument does not match the expected pitch output the reader of the score expects.

An even more prescriptive approach to notation is guitar tablature.[38] This provides a guitar-specific shorthand based on the physical location of the notes, regardless of the tuning. Unlike as-fingered notation however, the guitarist is given the exact locations for all of the notes taking any assumption or reconsideration out of the execution. This direct

[38] As none of repertoire considered utilizes tablature alone, it does not receive a dedicated case study in this exegesis.

connection between symbol and spatial location eases cognitive processing especially when multiple strings have been altered.[39] Since tablature is a shorthand form of standard notation, for classical guitarists—in the context of scordatura—it can be challenging to accurately identify what pitches are being played at any given time. This complicates the guitarist's ability to create alternative fingerings, identify melodic lines and analyse harmonic content. In order to mitigate these in a classical guitar context, tablature is usually accompanied by a second stave above that details pitches in at-pitch notation.

Hybrid notation aims to alleviate the issues which arise from the three styles discussed above by combining at-pitch notation with more prescriptive notation (either as-fingered or tablature) on the same score. This allows guitarists to read according to their strengths: whether they prefer the visual-auditory connection offered by the at-pitch stave or the visual-kinaesthetic connection offered by the prescriptive notation stave. Because only one stave can be read, detailed annotations are required across both staves. This provision of additional detail may cause discrepancies between the two staves, resulting in errors such as conflicting pitches, inconsistent or absent fingerings or missing performance directions. Due to the time-consuming nature of producing and annotating both staves, only some composers choose this method.

1.3.2. Cognitive Aspects

Using scordatura challenges a range of established skillsets, including fingering patterns, chord shapes, scales and intervals. These inconsistencies can also require large sections of notes to be decoded, a potentially frustrating and time-consuming task, that requires a degree of cognitive plasticity to adapt or build new neural pathways.

As more scordatura pieces are learned, performers myelinate new circuits. As suggested by Johnson, procedural memory can enable performers to retain connections between stimuli and responses and apply knowledge in similar situations.[40] This allows guitarists to retain connections and overlay their knowledge across a range of scordatura settings. By doing so guitarists can adjust and adapt their auditory maps of harmonic and melodic material. This also allows for the easier adaptation of the fretboard map and alternative fingerings for at-pitch notation, and reconciliation of auditory expectations for tablature and as-fingered notation.

[39] Mark Gaare, 'Alternatives to traditional notation', *Music Educators Journal, (March 1997):18.*
[40] Johnson, 496.

1.3.3. Kinaesthetic Aspects

Kinaesthetic aspects relate to the physical movements required for practice and performance. As discussed in the cognitive aspects section, guitarists not only expect certain results out of specific actions but are highly automated in their connection between visual and kinaesthetic regions.[41] Because scordatura challenges the compatibility of these processes, less myelinated circuits are available thereby slowing the process of practice and performance. This therefore requires the recalibration of the mental map of the fretboard, circumventing years of training that have established and consolidated fretboard navigation.

In addition to recalibrating the mental fretboard map, spatial awareness and control across the neck is impacted. In relation to at-pitch notation guitarists may find it more challenging to execute large shifts such as changing positions or chords, as they will likely aim for the position as found in standard tuning. In relation to as-fingered and tablature scores, spatial awareness is challenged as guitarists are required to identify the 'real' pitch of the note and map this against alternative sonic outcomes. Consequently, the fluency of reading and the process of creating alternate fingerings is slowed as guitarists will need to re-map (or transpose) note positions on the altered strings.[42]

In addition to the considerations required for mapping alternative sonic outcomes, guitarists will need to consider how lowering or raising the tension of the strings can impact the tone of certain notes. When strings are lowered it may become more challenging to produce a loud volume or crisp tone as too much tension has been removed from the string. This not only compels the guitarist to make tone colour choices based on the response of the strings, but also alters the touch and placement of the right-hand.

To lessen the impacts on kinaesthetic aspects, guitarists may find visualising the new fretboard map, identifying new chord voicings and playing single and cross-string scales on altered strings beneficial to identify new note locations.

[41] Gupta and Cohen, 435.
[42] Aaron Z. Lohmeyer, "The Effect of Varying Encoding Conditions on Jazz, Instrumental, and Choral Musicians' Memorization Accuracy: Implication for Music Literacy" (PhD dissertation, Florida State University, 2018), 2-3.

1.3.4. Auditory Aspects

A primary purpose of scordatura is to alter the tuning so that new tonal qualities can be achieved. Whether tuned to an open chord (for example D major in *Out of Clonmel*), a new series of intervals (*A Dog from Every Town* or Tarakihi) or simply an altered bass note (*Rosella* or *Lough Caragh*), the guitarist needs to adapt their auditory expectations for tonal quality, pitch and intonation.

Auditory aspects are challenged in combination with visual aspects. As discussed in the literature review, musicians typically utilise their skill of audiation to view the score and internally hear the notes without any external stimulus. [43] Audiation is particularly useful in the initial stages of learning a piece, as it allows the performer to anticipate harmonic and melodic material before reaching the instrument. Auditory expectations are challenged by as-fingered scores because the audiated pitches do not consistently match the instrument's resulting pitches. Without the accompanying at-pitch stave for reference, the 'real' sonic result of harmonic and melodic material for as-fingered notation is challenging to predict. In combination with kinaesthetic elements, guitarists may find it jarring that notes no longer have a specific tonal quality, sounding either darker when strings are lowered or brighter when strings are raised. To help mitigate this, guitarists can also listen to available recordings whilst reading the score to acclimatise to the new relationships between visual-auditory connections.

[43] Edwin Elias Gordon, *Rhythm: Contrasting the Implications of Audiation and Notation* (Chicago, GIA Publications, Inc., 2009), 20-24.

Chapter 2: Case Studies

As established in the key terms and concepts, many of the challenges that scordatura repertoire presents are directly linked to the style of notation. Therefore, each of the following case studies examines one of the four common types of notation, the challenges encountered with that specific style and its relevant practice adjustments. *Dans le Souffle du Temps* will represent at-pitch notation, *A Dog from Every Town* will represent as-fingered notation, *Out of Clonmel* will represent at-pitch/tablature hybrid notation and *Sonata of Forgotten Dreams* will represent at-pitch/as-fingered hybrid notation.

2.1. At-pitch Notation: *Dans le Souffle du Temps* – Lilith Guégamian

Lilith Guégamian's *Dans le Souffle du Temps* is written with the scordatura tuning of E-A-c$^{\#}$-g$^{\#}$-b-e'. In this piece, Guégamian uses at-pitch notation as the tuning changes are minimal—the third and fourth strings are only shifted by a semitone. Here the visual-auditory connections are prioritised, requiring guitarists to adjust their mental map of the fretboard. Although kinaesthetic and cognitive processes may be slowed initially, the guitarist will be able to identify patterns and harmonic and melodic material more readily in sounding pitches, making any alternative fingering choices relatively simple.

The necessary adjustments are comparatively straight-forward due to the fact that a large portion of the piece uses the altered third and fourth strings as open C-sharp and G-sharp drones facilitating playing ease while in the key of C-sharp minor. Because fingered notes on the third or fourth strings are located only one fret away from their location in standard tuning, necessary recalibrations of the fretboard map are comparatively easy. An example of this can be seen in Figure 2.1-1, where the F-sharp on the fourth string is now found in the fifth fret and the D-sharp in the chord on the following beat is found in the seventh fret.

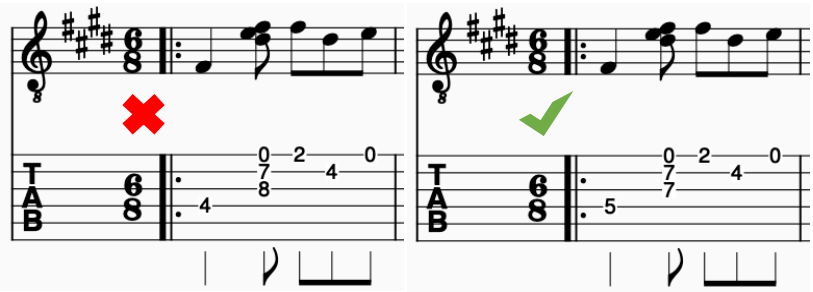

Figure 2.1-1: Dans le Souffle du Temps, m. 72.

This quick recalibration can be thought of similarly to learning to play in a key signature with many sharps or flats. The first encounter requires extra cognitive processing to remember which notes are affected and where they are played. Once the neural pathways have been sufficiently myelinated and ingrained through practice this becomes a built-in feature like playing any other piece.

While these adjustments appear very small, another challenge arises from the fact that the two altered strings are re-tuned in opposite directions. Because the fourth string is lowered from D to C-sharp and the third string is raised from G to G-sharp, this opposing motion can create an additional point of mental friction. In Figure 2.1-2, we can see the difference in fingering between where the kinaesthetic memory would lead guitarists to put their fingers (left) and where the new note positions are found (right).

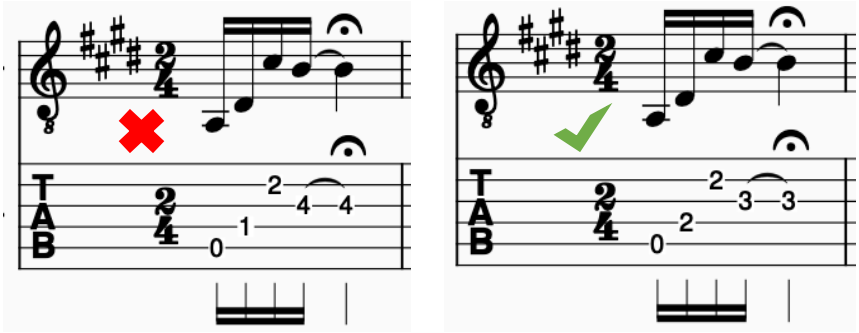

Figure 2.1-2: Dans le Souffle du Temps, m. 5.

At-pitch notation is particularly easy to misread if not sufficiently annotated as this is a vital tool to help ensure that kinaesthetic and cognitive misfiring is avoided. As illustrated in Figure 2.1-3 below, if measure 117 is misread, the ascending passage can result in an uncomfortable stretch as well as producing an inferior sonic result. While C-sharp and D-sharp are typically found on the fourth and sixth frets of the fifth string, here these two notes are much more easily and convincingly played on the open fourth string slurred onto the second fret of the same string. In contrast, if the open string is not used, the final three notes are on the same string, thereby eliminating the intended resonances.

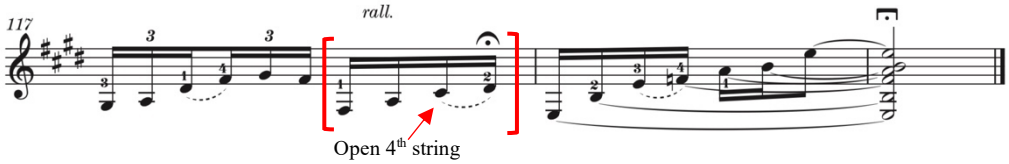

Figure 2.1-3: Dans le Souffle du Temps, mm. 117–110.

Similarly, in Figure 2.1-4 the final chord of measure 107 can be played in a variety of ways. From the context of the passage, the descending figure seems to land in first position with the C-natural on the second string. However, the guitarist will need to remember the newly available C-natural right above the D-sharp on the fourth fret.

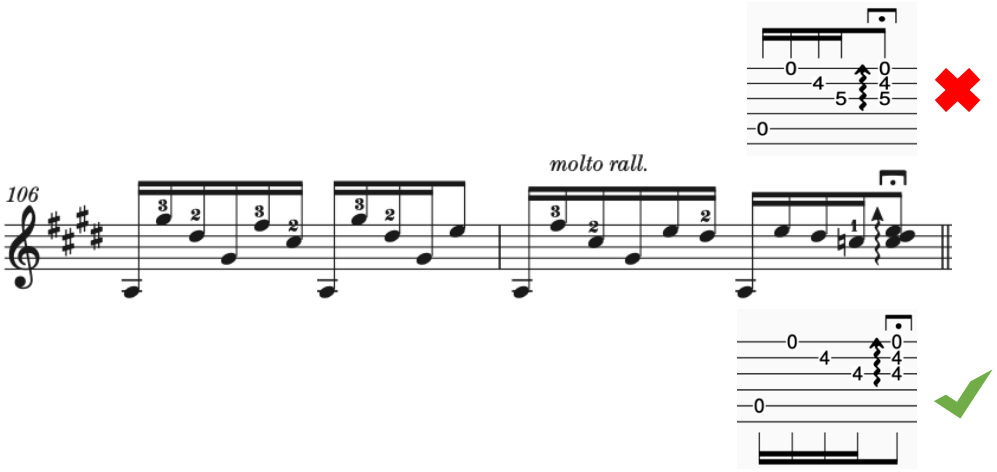

Figure 2.1-4: Dans le Souffle du Temps, mm. 106–107.

In summary, while performer is only making small recalibrations to their cognitive and kinaesthetic processes, these impacts are greatly minimised by the small adjustment in tuning. In cases where multiple strings are altered by large intervals in opposing distances, the guitarist faces similar issues to those discussed above, only with more regularity and greater complexity.

In the case of *Dans le Souffle du Temps,* guitarists are given at-pitch notation which confirms visual-auditory connections. Guitarists will benefit from understanding how notation affects cognitive and kinaesthetic processes, ensuring that pitches on altered strings are accurately played. Initially, this involves identifying which strings have been altered, by what interval, and in what direction. Then, it is helpful to create single-string scales to identify where the new notes are located on the altered strings. When fingerings have been identified and annotated, slow, repetitious practice is crucial to recalibrating and consolidating visual-kinaesthetic connections.

2.2. As-fingered Notation: *A Dog from Every Town* – Bryan Johanson

As a result of lowering the tuning of his guitar during transit, Bryan Johanson was inspired to write a piece based on the instrument's settled tuning of D^{b}-A^{b}-c-f-a^{b}-d'. *A Dog from Every Town* is one of the most complex scordatura settings in this project as all six strings are lowered by irregular intervals. Due to the difficulty of remapping the fretboard without any reference points, Johanson has chosen to notate the piece in as-fingered notation. Here the visual-kinaesthetic connection is prioritised, minimising the initial cognitive load of such a significant tuning difference. In this case, because the guitarist is already familiar with the stipulated fretboard positions in standard tuning, as-fingered notation is less challenging to understand than at-pitch notation. Conversely, auditory processes, musical analysis and fingering considerations are significantly more challenging.

Johanson comments in the foreword of the piece that 'the score is intended to be fingered in the simplest manner possible, largely in the first and second positions.'[44] Where there are any changes of position or potential confusion for note positions, Johanson typically annotates these with strings numbers. An example of this can be seen in Figure 2.2-1, where the bass passage clearly annotates for the final note to be played on the sixth string instead of the fifth string like the rest of the bar. This is a very important annotation as the same note could be played on the fifth string as is the case for the rest of the passage. However, the pitch produced would be A-natural instead of E-natural (as-fingered A-sharp).

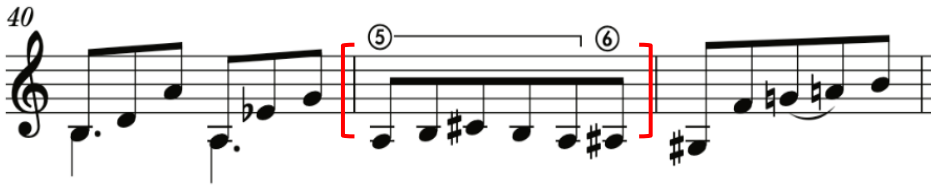

Figure 2.2-1: A Dog from Every Town, mm. 41.

[44] Bryan Johanson. A Dog from Every Town. (Québec: Les Productions D'Oz, 2013), 2.

Similarly, in Figure 2.2-2 Johanson annotates the melody beginning in measure 27 as being played on the second string, requiring for the measure to be played in fourth position. The melodies in the proceeding two measures can also be assumed to start on the second string, moving down a position each time.

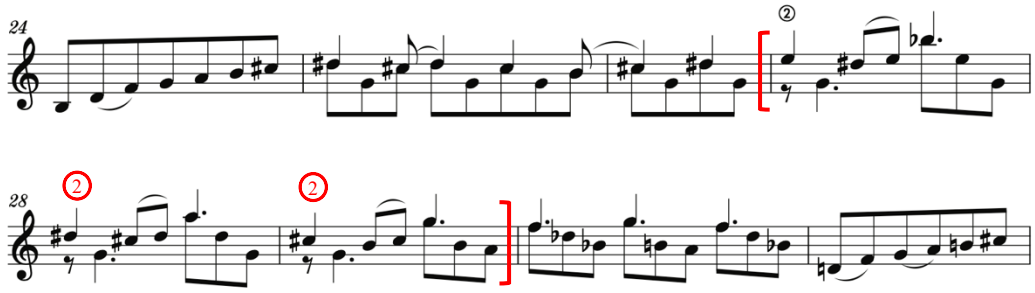

Figure 2.2-2: A Dog from Every Town, mm.24–31.

Figure 2.2-3 and Figure 2.2-4 illustrate a key issue with as-fingered notation. Each of these slurs utilises an open string—ascending slurs moving from the open string and descending slurs moving onto the open string. In the first occurrence of this passage, the last pair of slurred notes does not follow this pattern. The implied sonority of the figure identifies the final note as a g (at-pitch a-flat). Because there is no at-pitch stave, the guitarist will need to determine the intended pitch; either following the pattern of the last 3 groups or playing the note as written. It is not until later that the guitarist can recognise this as a typo as it is later corrected in measure 122 (figure 2.2-3).

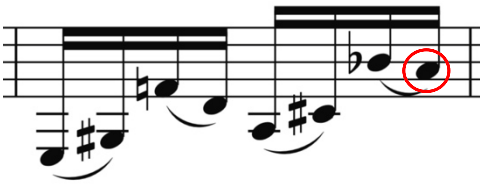

Figure 2.2-4: A Dog from Every Town, m. 66.

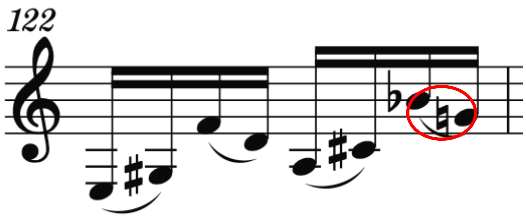

Figure 2.2-3: A Dog from Every Town, m. 122.

In order to understand the harmonic context of Figure 2.2-5 the guitarist will need to transpose a total of twenty-five pitches. Looking at the as-fingered pitch provided, it is highly unlikely that the guitarist would audiate this as a diatonic passage in Ab-major, as can be seen by the at-pitch transcription in Figure 2.2-6. Initially, this passage may be challenging for the auditory system to reconcile, but once the guitarist is more familiar with the passage the disorientation is reduced as the auditory system adapts.

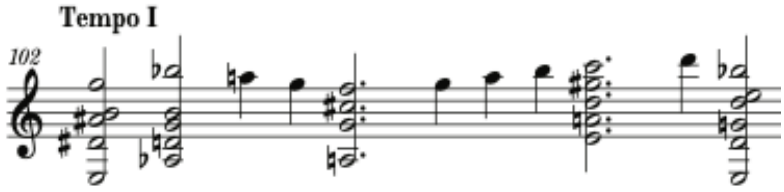

Figure 2.2-5: A Dog from Every Town, m. 102.

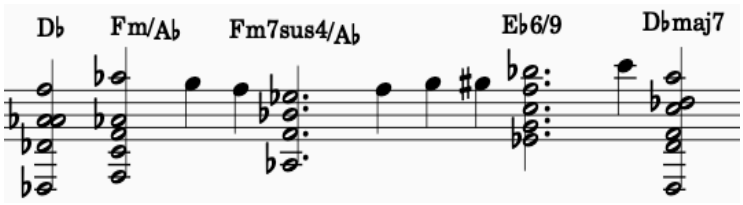

Figure 2.2-6: A Dog from Every Town, m. 102. At-pitch transcription.

Illustrated in Figure 2.2-7 and Figure 2.2-8 is the degree to which scordatura can alter melodic and harmonic perception. The first quaver beat looks like a major ninth whereas the interval produced is a minor ninth. Similarly, on the third quaver beat, the interval seems to be a minor tenth but the interval produced is a major tenth. Having all of these misrepresented intervals can become quite disorientating for guitarists who prioritise visual-auditory connections.

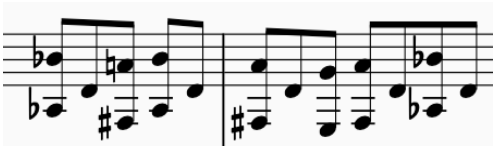

Figure 2.2-8: A Dog from Every Town, mm. 64–65. As-fingered.

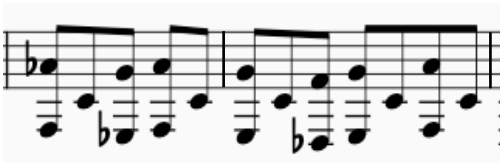

Figure 2.2-7: A Dog from Every Town, mm. 64–65. At-pitch transcription.

By nature of the notation, practice for as-fingered notation does not differ substantially from that of standard tuning. Because the main disconnect occurs between auditory and visual connections, listening to recordings is a great aid to help adjust aural expectations. To perform as-fingered notation consistently, it may be particularly beneficial for the guitarist to establish fingerings early on, since as-fingered notation relies on kinaesthetic memory. Alternative fingering considerations require the identification of the required pitch and mapping alternative locations onto the altered strings. To consolidate fingering, mental practice strategies such as visualising passages across the fretboard and associating the new note locations with the imagined sound of the piece can be used. This prepares the kinaesthetic system before the visual-auditory system is affected.

2.3. At-pitch/tablature Hybrid Notation: *Out of Clonmel* – Gary Ryan

Gary Ryan's *Out of Clonmel* utilises the tuning of D-A-d-f#-a-d' producing a D-major chord when all open strings are played simultaneously. Here, Ryan opts to use hybrid notation with at-pitch and tablature staves. This tuning presents an interesting situation as guitarists are familiar with the regular note positions of the fourth and fifth strings allowing for these note positions to be transposed onto the altered sixth, second and first strings with relative ease. The issue with reading the at-pitch notation stave comes from overlaying all these changes at once. This is where the tablature is useful because it provides a shortcut to locating the note positions.

A prime example of this comes from the final section of the piece as can be seen in Figure 2.3-1. Reading these six-note chords in the at-pitch stave, the guitarist will need to remember that the open strings create a D-major chord, fighting the urge to place fingers down for the top three notes as they would in standard tuning. Quickly referencing the tablature stave in this scenario aids in quickly identifying and playing the chord.

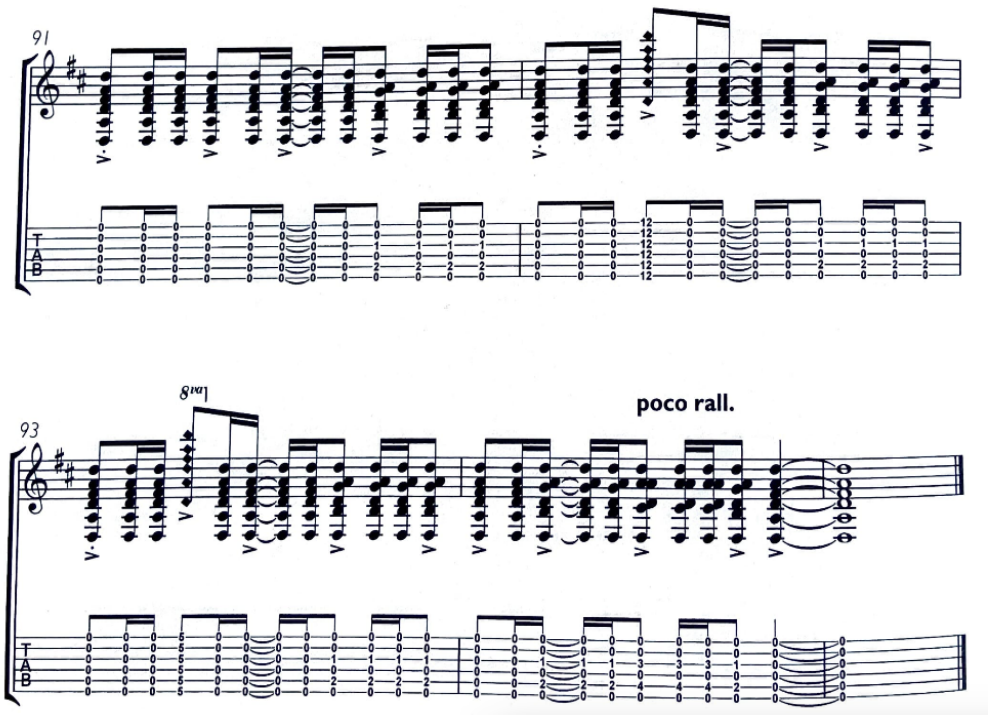

Figure 2.3-1: Out of Clonmel mm. 91–95.

Similarly, if reading the at-pitch notation, guitarists will need to reconcile the new note placements on altered strings. Because the treble strings are altered by different intervals (first and second strings lowered by a tone and the third string being lowered by

a semi-tone), without the tablature the guitarist would be required to adapt their mental fretboard map accordingly. Figure 2.3-2 shows the top tablature stave where the notes are found in standard tuning, and where the guitarist would be naturally inclined to play the pitches, whereas the bottom tablature stave shows the new pitch locations.

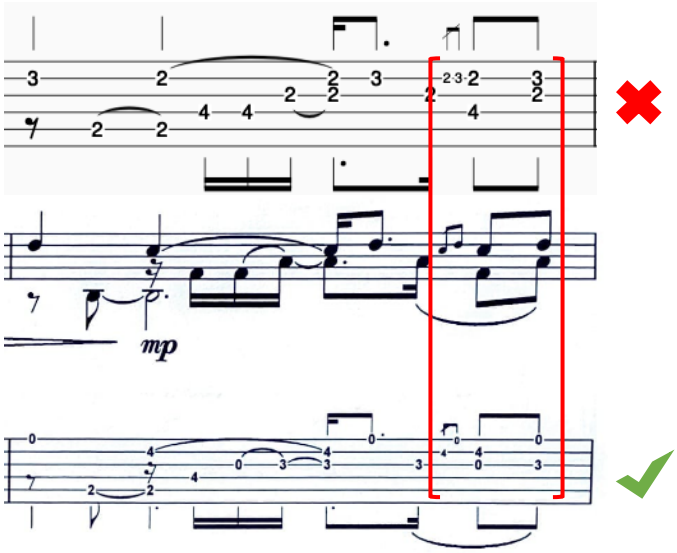

Figure 2.3-2: Out of Clonmel, m. 75.

Guitarists can bypass updating their fretboard maps by utilising the tablature stave; however, the at-pitch stave should always be referenced when learning. As shown in Figure 2.3-3, measures 23 and 25 are identical but the tablature shows two alternate placements of the second semi-quaver of beat two. Although this may seem like a minor detail, playing the A on the same string as the C-sharp as seen in measure 25 eliminates the possibility of the strings ringing out with an A-major thereby producing an inferior sonic result. It is also likely that the guitarist will recognize that this is the same passage, which will require them to retrace their fingerings to confirm and thus extending learning time.

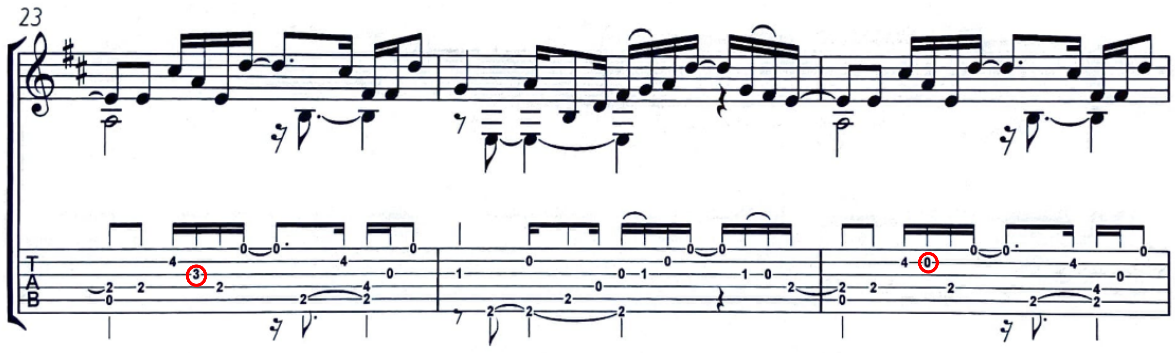

Figure 2.3-3: Out of Clonmel, m. 23–25.

As discussed in the key terms and concepts, having two staves doubles the engraving and annotating work for the composer, increasing the chance of discrepancies between the two staves. Figure 2.3-4 shows an F-sharp being held over the measure but is written across two strings in the tablature. As tablature only prescribes note locations this can create confusion until the guitarist identifies the note and confirms it as the one tied from the previous bar. Continually double-checking notes is an extra step that can extend the learning process, but it is also vital to ensure accuracy.

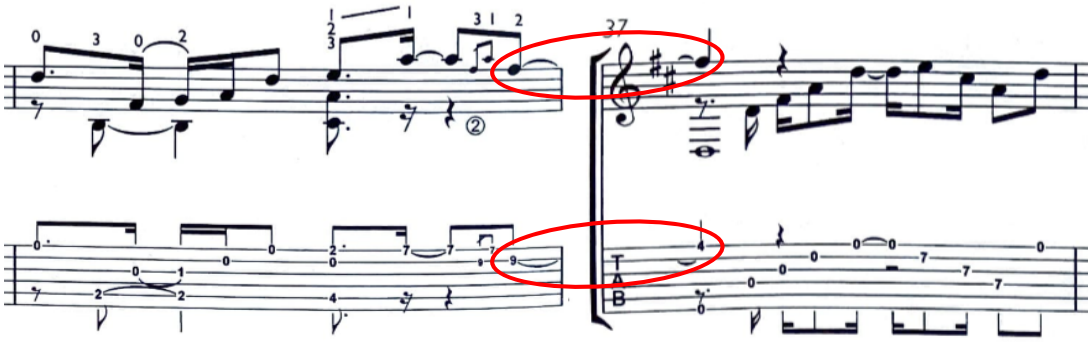

Figure 2.3-4: Out of Clonmel, m. 36–37.

Figure 2.3-5 shows the same note spread between an open string and a closed string. Regardless of which stave the guitarist is reading challenges can be found. Guitarists reading the at-pitch stave will need to update their fretboard map so that the D in measure 31 is located on the open first string and the D belonging to measure 32 is located in the eighth position, one fret away from its usual location. If reading the tablature, the guitarist might be unaware that the same pitch is being played twice; here the guitarist should ensure the tone of both notes is the same. Either way, it is essential that the guitarist matches the tone between the open string and the closed note.

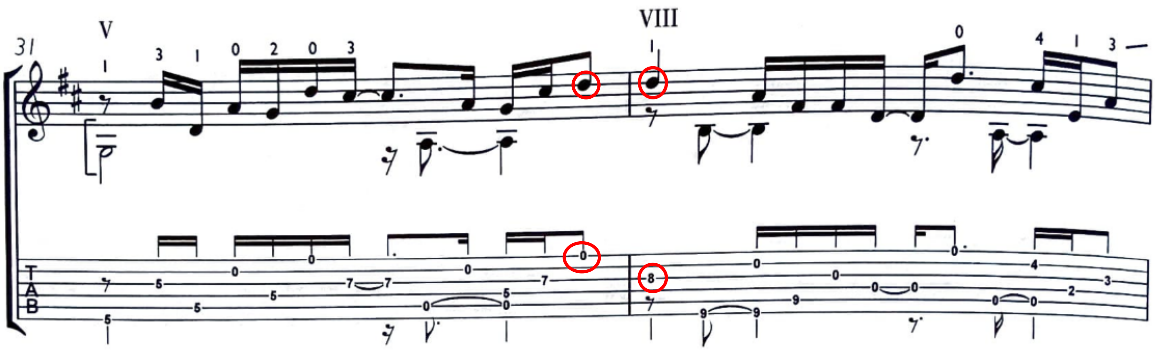

Figure 2.3-5: Out of Clonmel, m. 31–32.

Another problem with using tablature alone is the increased difficulty of identifying melodic shape, rhythmic values and harmonic material. When looking at the tablature in Figure 2.3-6, distinguishing melody notes from the accompaniment can be challenging as the separate voices are interwoven. By referencing the at-pitch stave here, guitarists will be able to better audiate the phrase, allowing them to better discern melody from accompaniment.

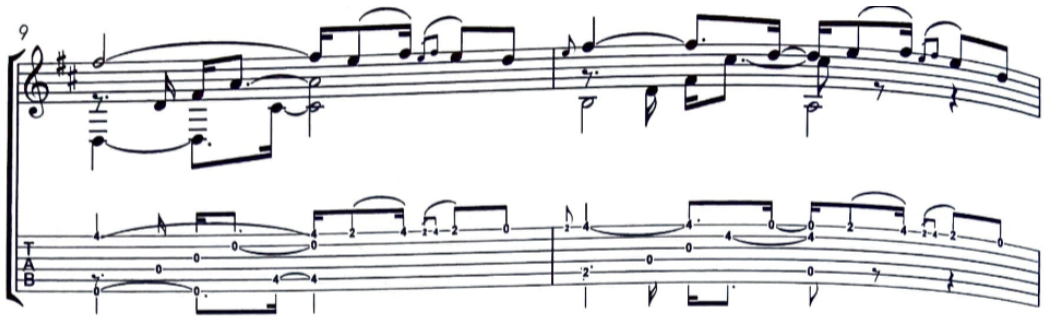

Figure 2.3-6: Out of Clonmel, m. 9–10.

With at-pitch/tablature hybrid notation, guitarists can read to their strengths, allowing them to prioritise the stave that best suits their learning preferences. Guitarists should then read through the piece slowly, consulting the other stave when questions and inconsistencies arise. If the guitarist chooses to read the at-pitch stave, identifying the new note locations across the altered strings will be beneficial. Utilising mental imagery, practising single-string scales and identifying new chord voicings can aid in consolidating new pitch locations. If the guitarist chooses to read the tablature stave, highlighting the melody notes while referencing the at-pitch stave can be highly beneficial for phrasing.

2.4. At-pitch/as-fingered Hybrid Notation: *Sonata of Forgotten Dreams* – Richard Charlton

The tuning E-G#-c#-g-b-e' allows Richard Charlton to use a multitude of harmonic possibilities that are impractical with standard tuning. While this specific tuning is uncommon, the small, semi-tone adjustment to the fourth and fifth strings is relatively straightforward to reconcile. A guitarist himself, Charlton utilises his knowledge of the guitar to provide a hybrid notation score, describing the at-pitch stave as 'guitar at concert pitch' and the as-fingered stave as 'guitar with scordatura' as can be seen in Figure 2.4-1. Interestingly, a separate 'performance score' is included with the full hybrid score displaying only the as-fingered notation, perhaps assuming in this context guitarists will prefer maintaining the connection between visual and kinaesthetic processes.

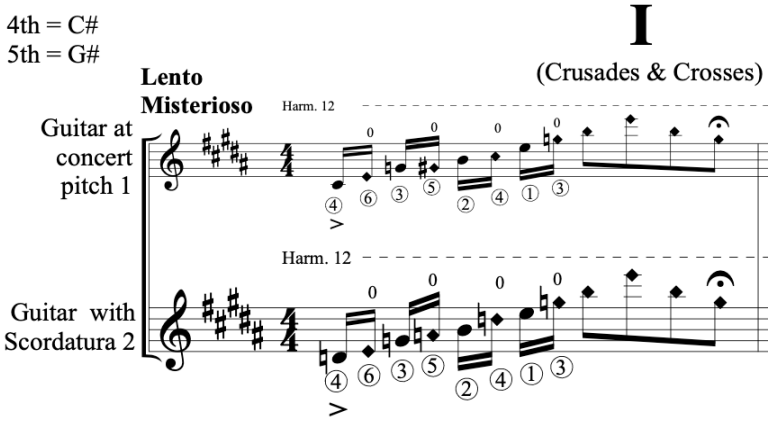

Figure 2.4-1: Sonata of Forgotten Dreams, Movement 1, m. 1.

The use of hybrid notation grants guitarists the ability to read according to their strengths. This allows the guitarist to prioritise either the visual-auditory connection provided by the at-pitch stave or the visual-kinaesthetic connection provided by the as-fingered stave, while also allowing for cross-referencing of specific moments.

This ability to cross-reference notation mitigates a range of auditory, cognitive, kinaesthetic and visual challenges. As can be seen in Figure 2.4-2 an example of a potential cognitive challenge is contained in the main motifs of movements one and four, where the as-fingered notation alternates between bass notes that appear to be a semitone apart. However—as accurately reflected in the at-pitch notation above—the second and third semiquavers of each motif are played across the fifth and sixth strings, producing two notes

that are in fact in unison. By referencing both staves, the guitarist is able to scan both staves allowing them to use their auditory, cognitive and kinaesthetic systems.

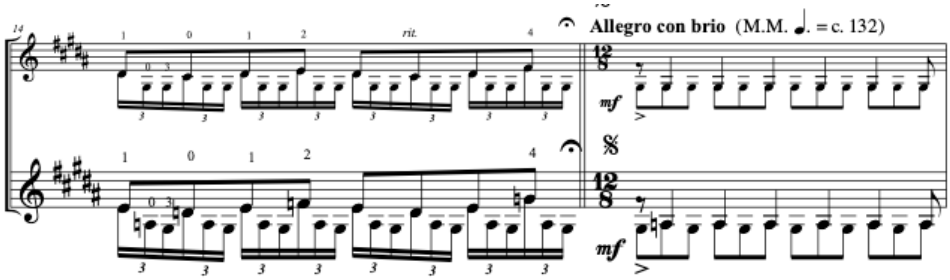

Figure 2.4-2: Sonata of Forgotten Dreams, Movement 1, mm. 14–15.

Similarly, in Figure 2.4-3, the as-fingered stave shows a moving bass line whereas the at-pitch stave outlines repeating G-sharps. Using the as-fingered stave alone may cause auditory circuits to misfire, anticipating the same note but instead, hearing repeating pitches. On the other hand, using the at-pitch stave alone, the guitarist may be inclined to repeat the G-sharps on the same string, an inferior sonic realisation and one that is not recommended on the as-fingered stave.

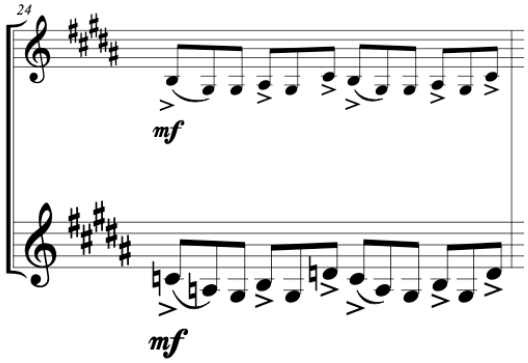

Figure 2.4-3: Sonata of Forgotten Dreams, Movement 4, m. 24.

A key advantage of at-pitch/as-fingered hybrid notation is the ability to easily create alternative fingerings. An example of this can be found in Figure 2.4-4. A transition is required from notes in first position to a chord in eighth position. Because no fingering guidance is provided, the guitarist needs to identify a solution themselves. This makes the first quaver jump from G-sharp to the chord almost impossible to make in time, even if extra time is taken in a musical way.

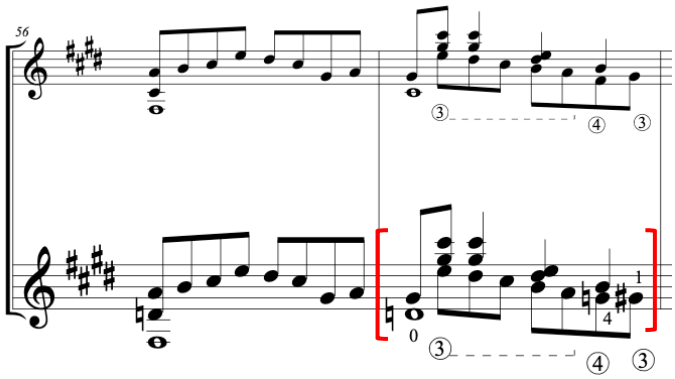

Figure 2.4-4: Sonata of Forgotten Dreams, Movement 1, mm. 56–57.

Because the at-pitch stave is provided, alternate fingering solutions can be more readily identified here. In this particular case, the open E on beat 2.5 can be used as an opportunity to shift to fifth position for the second half of the bar, allowing for a smaller shift to eighth position. However, the G-sharp and A would need to be played on the altered fourth string, meaning notes would be one fret/one semitone lower than what is notated in the as-fingered stave. Even though the tuning is only slightly altered, the unfamiliar interval change poses a challenge to the cognitive and kinaesthetic systems as the ingrained fretboard map is off by just one fret.

Another section that benefits from having the at-pitch stave available can be seen in Figure 2.4-5. Here Charlton advises that the top note of each chord be played on the fourth string. With the fingering provided, the left-hand is required to move from third position to fifth position to reach the final three notes in the top voice. Consequently, this fingering choice makes a legato top line impossible because the change in position creates a break in the sound.

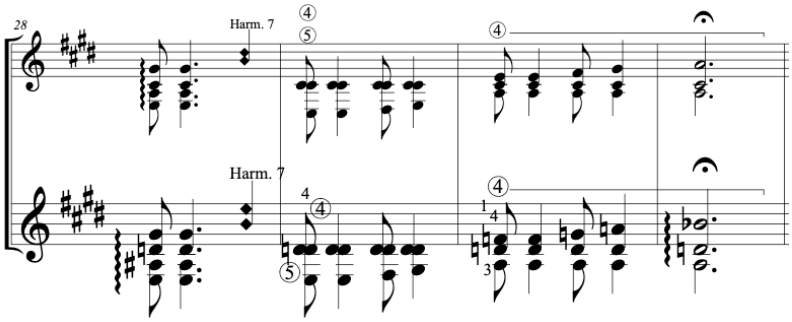

Figure 2.4-5: Sonata of Forgotten Dreams, Movement 3, mm. 29–31.

A solution to this can be to shift to fifth position for the first chord of the bar. For this the first two Fs would be played on the fifth string and the open fourth string can

produce the D (real-pitch C-sharp). A barrée can then be placed from the second chord with the bottom two notes of the chord being under the barrée and the rest of the melody being played on the fourth string as requested. By doing this, the bass note A can continue ringing to help camouflage the stopping of the other two notes.

A final example of where the at-pitch stave can be referenced for alternate fingerings can be seen in Figure 2.4-6. Here the espressivo sequence in measure 61 is annotated to be performed exclusively on the fourth string. Due to the marking of '*Lento Misterioso'* the guitarist may find it challenging to play all the notes in the sequence at the desired speed and colour all on the fourth string as it is prone to squeaking. Alternatively, the guitarist can perform all notes in fifth position, with the first five notes being played on the fifth string.

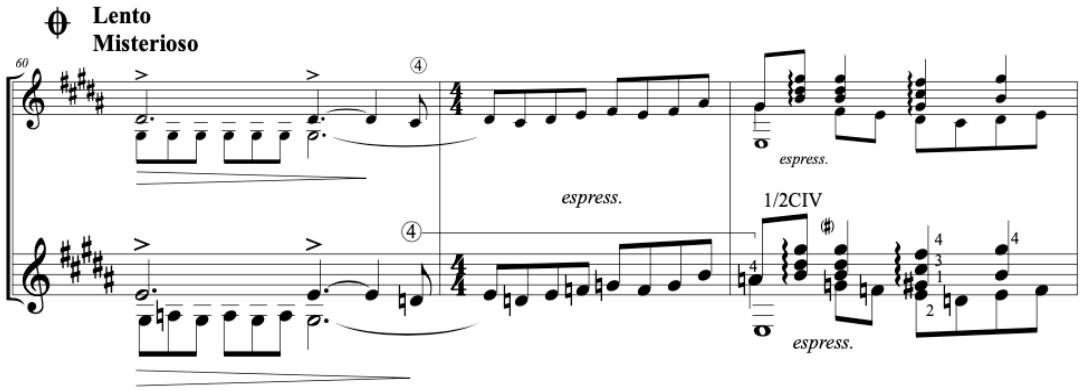

Figure 2.4-6: Sonata of Forgotten Dreams, Movement 4, mm. 60–62.

Similarly to at-pitch/tablature hybrid notation, at-pitch/as-fingered notations allows guitarists to read to their strengths, prioritising either visual-auditory connections or visual-kinaesthetic connections. Having both staves accessible to read also allows for alternative fingerings to be identified with greater ease than if either stave was presented alone. Because *Sonata of Forgotten Dreams* has a relatively small tuning alteration, it is practical to be able to read the at-pitch notation. In the case where the tuning alterations are more extreme, the at-pitch stave serves more as a reference guide for the guitarist to adapt their auditory expectations. Due to the way fingerings are expressed, the as-fingered notation facilitates reading while—unlike tablature—melodic devices such as sequences are easier to recognise.

Conclusion

Through practice-led research, this project has identified the key challenges classical guitarists face when practicing and performing scordatura works. These include the selection and curation of suitable repertoire, decoding and interpreting notation styles, and synthesis and practice of recital programmes that incorporate scordatura pieces.

Careful selection of repertoire and mindful curation of a programme is vital to performing scordatura works especially when multiple tunings are used throughout the performance. To navigate this effectively, guitarists should structure recitals so that the distance between different tunings is minimised, grouping pieces according to their tunings and scheduling intermissions to accommodate large tuning changes.

Key challenges around decoding and interpreting notation styles are identified such as the misdirection of established cognitive systems, shifting auditory and kinaesthetic expectations and navigating various tunings in a recital setting. From the outset of learning a scordatura work, the guitarist must be aware of three central differences. First, how have the string(s) been altered. Second, what style of notation is used and how this may challenge established cognitive circuits. Third, which processes need to be adjusted, for instance kinaesthetic memory with at-pitch and auditory expectations with as-fingered and tablature.

The practice of scordatura works will differ depending on the style of the notation and the learning inclinations of the performer. By utilising mental practice strategies such as visualising the fretboard, the guitarist is able to adjust expectations of kinaesthetic and auditory outputs, whilst also building awareness and confidence in the altered tuning. Practice should also prepare the guitarist to be aware of how tunings relate in the recital context. In this way, tunings can be traversed smoothly, and moments where tuning falters can be identified and choreographed to be corrected mid-piece.

Through the four case studies key challenges have been identified in relation to each style of notation. At-pitch notation favours visual-auditory connections, enabling the guitarist to quickly analyse harmonic and melodic content at the expense of kinaesthetic memory. As-fingered notation prioritises visual-kinaesthetic connections, allowing guitarists access to their established map of the fretboard, this however can be jeopardized if the notation is not clearly annotated and may cause auditory confusion. Hybrid notation styles allow guitarists to read from the stave that best serves their preferred learning style, whether this be maintaining visual-auditory connections provided by at-pitch notation or visual-kinaesthetic connections provided by as-fingered and tablature notation.

Although the project's scope did not allow for an in-depth examination of scordatura works from a psychological or pedagogical perspective, certain concepts introduced, such as audiation and myelination, could be expanded to inform future research in these areas. While acknowledging these limitations, there is ample opportunity for further exploration of the topics discussed, as well as a deeper investigation into the neurophysiological aspects of practice and performance of scordatura works on the classical guitar.

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Biography

New Zealand classical guitarist Megan Robson is undertaking her Master of Philosophy at The University of Adelaide with Dr Oliver Fartach-Naini. She has a particular interest in performing contemporary works for the classical guitar that involve alternate tunings.

Megan has been a prize-winner in several competitions including the award New Zealand Aspiring Guitarist of 2020, first place at the New Zealand Classical Guitar Competition (open division 2020, youth division 2016), and the SOUNZ prize for Best Performance of a New Zealand Work.

She has also received masterclasses from some of the world's leading guitarist such as Slava Grigoryan, Martha Masters and Gary Ryan.

Megan Robson – Classical Guitar Recital

Friday, October 14th, 2022

In partial fulfilment of Master of Philosophy

Elder Hall
Elder Conservatorium of Music
The University of Adelaide

Supervisors: Dr. Oliver Fartach-Naini & Mr Stephen Whittington

About the recital

This recital comprises four works which utilise *scordatura*, a technique that involves the alteration of the guitar's tuning away from the standard of E-A-D-g-b-e' (low to high strings). The curation of this programme is aided by using works with similar tunings. By doing so, the aim is to sonically contextualise the altered strings and keep at least one string as a reference pitch to allow tuning mid-piece adjustments if necessary. This helps lessen the effect of string creeping and the need for touch ups during the piece.

Programme

Sonata of Forgotten Dreams **Richard Charlton (b. 1955)**

I. Crusades & crosses
II. The games of chance
III. Reconciliations & regrets
IV. Recurring dreams

Tuning: E-G#-c#-g-b-e'

Dans le Souffle du Temps **Lilith Guégamian (b.1971)**

Tuning: E-A-c#-g#-b-e'

Koyunbaba **Carlo Domeniconi (b.1947)**

I. Moderato
II. Mosso
III. Cantabile
IV. Presto

Tuning: C#-G#-c#-g#-b-e'

Southern Cross **Marián Budoš (b. 1968)**

I. Rubato
II. Allegro Vivace

Tuning: C-A-c-g-c'-e'

Programme notes

Dedicated to Australian guitarist Tim Kain, ***Sonata of Forgotten Dreams*** by composer **Richard Charlton** is structured in four movements, each exploring a unique dreamscape. The main inspiration Charlton credits for this piece is the documentary *Cave of Forgotten Dreams*, where a film crew records the inside of Chauvet Cove (France), covered with some of the world's oldest surviving paintings. "The 30,000-year-old drawings, represent some of humanity's earliest dreams – forgotten for many centuries, but still there, as fresh as the day they were painted!"

Dans le Souffle du Temps ("in the breath of time") was commissioned by guitarist Heike Matthiesen as part of her 'covid commissions' series, which focuses on commissioning new works by a variety of female composers. In this piece, **Lilith Guégamian** draws on themes found in Jules Supervielle's *Les Chevaux du Temps*, an existentialist poem about the passing of time. A sense of contemplation permeates the piece, with delicate and tranquil passages developing into sweeping melodies.

Carlo Domeniconi's four-movement suite ***Koyunbaba,*** has become one of the most famous examples of works that use scordatura on the classical guitar and has become a staple of its modern repertoire. Its title contains multiple references to the inspiration of the piece, the first being to a region in the southwest of Turkey named after the saint Koyunbaba, and the second being to the rough translation of Koyunbaba, which is 'shepherd' (Koyun = sheep, baba = father).

Australian-based composer **Marián Budoš** composed ***Southern Cross*** in 1996 as a musical postcard to European guitarist Ján Labant. After its premiere, Labant commented on the symbolism of the harmonics motif depicting the points of the cross, emphasizing the bright seven-pointed star. Following this performance, Budoš expanded Southern Cross into a suite of pieces including two more scordatura works – *Aurora Borealis* and *A Little Piece of Heaven*. Whether performed as a suite or stand-alone, the overarching theme of outer space is discernible throughout. *Southern Cross* illustrates this with its dark floating passages, bright star-like harmonics, and explosions of driving basslines that give the impression of a supernova blast.

MEGAN ROBSON

Second Masters Recital

THURSDAY, MARCH 30TH, 6PM

EMU Studio, Shultz Building, Level 5
The University of Adelaide

Supervisors: Dr. Oliver Fartach-Naini
& Mr. Stephen Whittington

About the recital

This recital comprises of works that utilise s*cordatura*, a technique that involves the alteration of the guitar's tuning away from the standard of E-A-D-g-b-e' (low to high strings). The curation of this programme is aided by using works with similar tunings. By doing so, the aim is to sonically contextualise the altered strings and keep at least one string as a reference pitch for mid-piece tuning adjustments.

Programme

Labantina – Presto Labanuto **Marián Budoš (b. 1968)**
Tuning: F-A-c-g-a-e'

Rosella **James Rawley (b. 1997)**
Tuning: F-A-d-g-b-e'

Kinkachoo, I Love You **Phillip Houghton (1954–2017)**
God of the Northern Forest
Tuning: F-A-d-g-b-e'

Ophelia
I. Fear… and the angel
II. Suffering and madness… am I but a dream of a shadow?
III. Chant… of the flower-moon
IV. Water… memories-halls of ghosts-wash away
V. Death… with moons in your hair
Tuning: E^{b}-G-d-g-b-e'

–Intermission–

A Dog from Every Town **Bryan Johanson (b. 1951)**
Tuning: D^{b}-A^{b}-c-f-a^{b}-d'

Tarakihi **Bruce Paine (b. 1953)**
Tuning: C-G-d-f-a^{b}-d'

Out of Clonmel **Gary Ryan (b. 1969)**
Tuning: D-A-d-$f^{\#}$-a-d'

Greenglade **Jack Daws (b. 1996)**
Tuning: D-A-d-$f^{\#}$-b-e

Lough Caragh **Gary Ryan (b. 1969)**
Tuning: D-A-d-g-b-e'

Sunburst **Andrew York (b. 1958)**
Tuning: D-A-d-g-b-d'

Programme Notes

Marián Budoš composed ***Labantina*** as a musical joke for his friend Jan Labant, with the title and tempo marking of each movement referencing his name. The pieces are meant to be light and humorous giving Labant a chance to 'cool-down' following a performance of Budoš' concerto. In this first movement, ***Presto Labanuto***, the tongue-in-cheek nature is characterised by unexpected shifts in tonality.

James Rawley's ***Rosella*** depicts the movements, colours, and flight patterns of this colourful Australian bird. The piece begins with its main theme, fast-paced and skittish as the melody flits back and forth in 3/8 time. After a brief quiet moment, the theme is re-introduced in a higher register and in 6/8, as the rosella starts to soar a little more gracefully. The music then gives way into a high energy section with colourful chords and melodic fragments over an open-F pedal, before returning once again to the opening theme.

The following three works are all composed by Australian composer and guitarist **Phillip Houghton.** ***Kinkachoo, I Love You*** follows the journey of a wounded Kinkachoo, a mythical bird, healing and flying into the world. Houghton calls for a sense of weightlessness, allowing for the simple melody to 'flow, hover and glow'.

God of the Northern Forest was written for Houghton's former teacher, Sebastian Jorgensen, who's Nordic heritage and childhood experiences growing up in Eltham, Victoria shaped the images evoked in the piece. Throughout the piece, Houghton creates a chiaroscuro (light and dark) effect as the themes merge and interact.

Taking inspiration from Shakespeare's Hamlet, ***Ophelia***...a haunted sonata is a continuous five-moment work described by Houghton as a 'journey through an emotional and spiritual landscape'. The piece is characterized by its ethereal and haunting atmosphere, utilising the full colour palate of the guitar. Each movement follows Ophelia's sadness, grief and introspection as ultimately her tragic fate is sealed.

Moving to the United States, ***A Dog from Every Town*** by composer **Bryan Johanson**, was imagined after Johanson flew home after a guitar festival. The composer lowered the tuning of his guitar to reduce string tension for the flight and was inspired to write a piece around the instrument's settled tuning D^{b}-A^{b}-c-f-a^{b}-d'. Due to each string being lowered in pitch, the tension of the strings is considerably reduced resulting in a particularly dark timbre.

Tarakihi (song of the cicada) is **Bruce Paine**'s homage to the traditional Māori folk song of the same name. While the piece initially began as a 'conventional arrangement', it gradually developed into an entirely new composition with only passing reference to the original. Using textures inspired by the scratchy, clicking sounds of the cicada in the middle of a New Zealand summer, the piece pays homage to the energy and impact of the Māori haka.

Out of Clonmel was written as a tribute to **Gary Ryan**'s grandfather who came from Clonmel in County Tipperary, Ireland. This piece is filled with an 'energetic Irish flavour', reflecting Irish folk music. This is exemplified by melodies decorated with ornaments, imitating Irish pipes and whistles. Here the guitar has been tuned to an open D major chord, creating a resonant and cheerful sound.

This piece is named after **Jack Daws**' childhood street, ***Greenglade*** Drive. The composer decided to name the work in honour of Gary Ryan's sentimentally named Irish works—works which bookend this premiere performance. The lively 'A' theme features a 6/8 melody that is passed between different voices. As the piece progresses, tension builds with the use of power chord figures and sighing 2-against-3 melodies. The bass then breaks away into a sequence of lively 12/8 melodies, settling into a quasi-improvised groove. The piece reaches its climax with a renewed rendition of the 'A' theme, before winding down to a wistful reprise.

Gary Ryan's Lough Caragh is named after a lake in south-west Ireland, that Ryan visited during his travels through the country. The music is inspired by the beauty and tranquillity of the lake, and the surrounding landscape of mountains and forests. The piece begins with a delicate and introspective melody, its fluidity and grace mimicking the peaceful lake. The music gradually builds in intensity, with rich harmonies that evoke the vastness and power of the natural world.

Andrew York is a renowned American guitarist and composer, known for his innovative and eclectic approach to music. ***Sunburst*** showcases York's compositional voice style, blending classical, folk, and jazz influences. The piece begins with a bright and lively melody and is characterized by its persistent syncopation, which give the music a sense of movement and energy.

Appendix B: List of Considered Repertoire

Composer	Piece title	Tuning	Notation style
Andrew McKenna Lee	Arabescata (2001)	D-A-d-g-a-d'	At-pitch
Andrew McKenna Lee	Gravity and Air (2001)	C-G-d-a-a-d'	At-pitch
Andrew McKenna Lee	Dizzying Array (2001)	A-A-e-g-d-e'	At-pitch
Andrew York	Sunburst (1986)	D-A-d-g-b-d’	At-pitch
Annette Kruisbrink	Seis Pavanillas (2017)	E^{b}-A-d-g-b-e'	At-pitch
Bruce Paine	Tarakihi (2018)	C-G-d-f-ab-d'	As-fingered
Bryan Johanson	A Dog from Every Town (2013)	D^{b}-A^{b}-c-f-a^{b}-d’	As-fingered
Carlo Domeniconi	Koyunbaba (1985)	C$^{\#}$-G$^{\#}$-c$^{\#}$-g$^{\#}$-c$^{\#}$’-e’	Hybrid (transposed real-pitch/As-fingered)
Carlo Domeniconi	Toccata in Blue	D-A-d-f$^{\#}$-b-e	At-pitch
Dusan Bogdanovic	Six Balkan Miniatures (1993)	D-A-d-g-b-e'	At-pitch
Fabienne Magnant	Par Deux… (2010)	D-G-d-g-b-e	At-pitch
Gary Ryan	Lough Caragh (2008)	D-A-d-g-b-e’	At-pitch
Gary Ryan	Out of Clonmel (2008)	D-A-d-f$^{\#}$-a-d’	Hybrid (at-pitch/tablature)
Jack Daws	Greenglade (2023)	D-A-d-f$^{\#}$-b-e	Hybrid (at-pitch/tablature)
James Rawley	Rosella (2016)	F-A-d-g-b-e'	At-pitch
Leo Brower	Hika (1997)	E-G-d-g-b^{b}-e'	At-pitch
Lilith Guégamian	Dans le Souffle Du Temps (2021)	E-A-c$^{\#}$-g$^{\#}$-b-e’	At-pitch
Lilith Guégamian	Hov Arek (2017)	C$^{\#}$-A-c$^{\#}$-g$^{\#}$-b-e'	At-pitch
Manus Noble	Heal (2017)	C-G-c-g-c-e'	Hybrid (at-pitch/tablature)
Marco Ramelli	Blue (2021)	C$^{\#}$-A-d-g-b-e'	At-pitch
Marian Budos	A portrait of a Friend (1998)	E-G-c-g-b-e'	As-fingered
Marian Budos	Tres Meditacións (2019)	D$^{\#}$-G-d$^{\#}$-g-c'-e'	As-fingered
Marian Budos	Labantina (1997)	F-A-c-g-a-e'	As-fingered
Marián Budoš	Southern Cross (1996)	C-A-c-g-c’-e’	As-fingered
Mickael Luis	Anthropomorphism (2021)	B-B-d-g-b-e'	At-pitch
Nikita Koshkin	Tristan Playing the Lute (1983)	D-A-d-g-b-e'	At-pitch
Phillip Houghton	Kinkachoo, I Love You (1998)	F-A-d-g-b-e’	At-pitch
Phillip Houghton	God of the Northern Forest (1989)	F-A-d-g-b-e’	At-pitch
Phillip Houghton	Ophelia (2004)	E^{b}-G-d-g-b-e'	As-fingered
Richard Charlton	Sonata of Forgotten Dreams (2015)	E-G$^{\#}$-c$^{\#}$-g-b-e’	Hybrid (at-pitch/As-fingered)
Roland Dyens	Songe Capricorne (1994)	E-B-d-g-b-e'	At-pitch
Simone Iannarelli	Impromptu: La noche azul (2022)	C-A-d-g-b-e'	At-pitch
Stephen Goss	Hireath (2020)	F-A-d-g-b-e'	At-pitch
Thomas Viloteau	Chansonate (2022)	E^{b}-A-d-g-b-e'	At-pitch

Appendix C: Recital Scores

These scores are for examination purposes only and are NOT to be included in any publication of this exegesis