Timbre-based adaptation:
Rewriting John Cage’s *Sonatas and Interludes* for solo multiple percussion

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I hereby declare that this submission is my own work and has not been submitted for a degree or diploma in any university. To the best of my knowledge and belief, it contains no material previously published or written by another person except where due reference has been made in the thesis itself.

Bradley Adam Scott, December 2018
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Abstract

This research project documents the adaptation of John Cage’s *Sonatas and Interludes*, a prepared piano composition, for solo multiple percussion. As the prepared piano and multiple percussion are instruments reliant on the interplay between distinct timbres, as well as pitches, traditional methods of adaptation used on purely pitch-based instruments do not apply.

My research is presented in two parts. The first is an exegesis detailing the evolution of my ideas regarding the adaptation process. Three chapters are dedicated to the translation of dynamics, pitches, and notation from Cage’s prepared piano score to my own multiple percussion score, with musical examples highlighting the main points. The second is an appendix containing the entire performable score of *Sonatas and Interludes*, adapted for solo multiple percussion, containing the results of my research.
Foreword: A Personal Narrative

Native Adaptation

I cannot remember a time when I was not altering music. It seems that my performance repertoire always consisted of much more than the compositions assigned by various teachers. I would notate music that I had composed, but I would also attempt to play music heard on the radio or television. If I listened to a piece and liked it, I would want to be able to play it. Being fortunate enough to have learned many instruments during my childhood, I would generally be able to choose an instrument that would suit a particular piece.

In 1995, at the age of eleven, I adapted one of the demonstration songs from a piece of music software for xylophone in order to enter a radio competition. This is the first adaptation that has remained in my memory, but I believe that its permanence is due more to the fact that I won the competition than from anything particularly notable in the adaptation itself.

Throughout primary and secondary schooling, my adaptations were melody-based, but I became increasingly interested in the various timbres of multiple percussion during my tertiary studies. In 2002, the second year of my undergraduate Bachelor of Music degree, I played the percussion duo Marine Snow by Masao Endo as a solo piece. I approached this adaptation as a simple reduction, attempting to play as many of the original tuned and untuned notes as possible by simply deleting notes that were impossible to perform.

An important influence on my approach to listening to multiple percussion was the experience in 2004 of observing a fellow student learn Born to be Wild by Steppenwolf,
arranged\(^2\) by David Lang. I tried to complete a similar adaptation of a popular song for percussion, my first attempt being Sir Mix-a-Lot’s *Baby Got Back*. Whereas Lang was more liberal in his interpretation of the original, mine was more of an “as close as it can be to the original” version in regards to pitches and timbres. It was impossible to perfectly replicate the entire song’s timbre and instrumentation, but, by using instruments with appropriate ranges and timbres, I created what I considered an accurate representation.

Adaptations became an increasingly important part of my musical education. I found that adaptation could be considered a form of analysis and could also allow me to appreciate all aspects of the original work in a new way. Adapting works was also much more interesting to me than playing something that had already been created (and performed) by someone else. However, I did not realise how much this predilection had taken over my choice of performance works until an audience member commented that 80% of my masters recital (2007) consisted of my own adaptations of other people’s compositions.

**Sonatas and Interludes**

I first became aware of John Cage when reading the *Collins Encyclopedia of Music* during my primary studies. He appeared different to other composers in that he was described as “the *enfant terrible* of modern music” (Westrup & Harrison, 1984, p. 99). Not knowing the French term, I was nonetheless intrigued by the use of the word “terrible” in relation to a composer. The accompanying picture was also interesting, showing a bearded man with a huge grin carrying a basket. This was in stark contrast to portraits of other composers, who generally had stern expressions.

In 2004 I borrowed a book from the Queensland Conservatorium’s library that was to prove vitally important to this project. *20/20: Twenty Sounds of the Twentieth Century*

\(^2\) Etymology of the adaptation process is discussed in Chapter 3. My preferred term is *adaptation*. Wherever possible, I will use the adapter’s term, which in David Lang’s case is *arrangement*. 
(Duckworth, 1999) was a comprehensive introduction to the variety of twentieth century music. In addition to the interesting narrative presented by Duckworth, the book contained a compact disc with excerpts of many of the pieces discussed. I was reading the book with the CD playing in the background, when I heard some percussion music. Knowing that there was no discussion of percussion in the book, I checked what I was listening to and found that instead of being percussion, it was Sonata V from Sonatas and Interludes (Cage, 1960) being played on the prepared piano. Cage’s imitation of percussion instruments had completely deceived me.

A few days later I realised that if the prepared piano sounded like percussion, I should be able to perform the piece using percussion instruments. The following day I went to the university library, located a copy of the score, and began an adaptation of that movement.

The transition from handwritten manuscript to first performance involved a few edits, but the finished product was actually very close to the first draft. The following week I played it for my teacher, Vanessa Tomlinson, and then later for my percussion class. After the second performance, she said “so, when do I get to hear the next one?” Up to this point, I had not considered adapting any other movements - in fact, I had not even listened to them. A quick scan through one of the university’s CDs revealed that out of the twenty movements, there were a few with percussive possibilities, however I did not pay much attention to a lot of the movements once I had selected the second one to complete.

In June 2004 I performed both Sonata V and Sonata XIV as part of my Honours recital. Post graduation I did not think about the piece at all until I commenced my masters degree at the University of Nevada, Las Vegas. My teacher there was Dean Gronemeier, developer of

\[^{3}\text{I have considered this (and other movements) “finished” several times over the last nine years. I now accept that each movement could be re-interpreted an infinite number of times in the future.}\]
an independent six-mallet grip. One of my priorities upon commencement of the degree was the acquisition of the basics of this technique from Gronemeier and his former student, Timothy Jones.

At this time, all available published works utilising the independent six-mallet grip were for solo marimba and I felt that the technique was not being exploited to its full potential. To address this, in September 2005 I wrote a paper entitled *Alternate Six-Mallet Uses* (Scott, 2005) that discussed three new uses for an independent six-mallet technique. The first two such uses were the application of a six-mallet technique to existing four-mallet works in order to minimise two aspects of performance: unwieldy one-hand intervals and performer movement. The third application of the technique was to multiple percussion. While a percussion instrument used in a multiple percussion setup has the greatest impact on the timbre produced, the choice of mallet can also alter the timbre. By using six mallets rather than four, the possible timbral varieties are much greater. In order to test my ideas I then adapted *Sonata IV* for my newly acquired six-mallet technique. In 2006 I realised that the adaptation of all twenty movements of *Sonatas and Interludes* was now inevitable and planned out an overall structure.

By the time of my doctoral studies in 2010, I had adapted six of the twenty movements. At this point I had several overarching concepts for the work which were well established, including a unified notation system. The past eight years have been spent documenting how my adaptation style has changed, which has forced me to question why I have chosen particular ideas over others. This documentation, in turn, has influenced the way that the adaptation style has evolved.

Over the course of adapting *Sonatas and Interludes*, my style has changed in almost every way imaginable. These changes can be broadly categorised into three groups. The first

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4 An independent six-mallet grip is a method of holding three mallets in each hand, allowing use of any single mallet or combination of mallets.
involves the acquisition of new techniques. The learning of an independent six-mallet grip allowed me to plan my adaptation around its limitations, as I had no interest in notating what would be impossible to perform. The second group of changes occurred due to the evolution of my listening technique. Although I have been listening to the same music for many years, the way that I have heard it has changed. A pitch-based example would be listening to a two note chord: C and the A above. Depending on its context it could sound like a C6 chord, or alternately like an A minor chord. Static elements comprised the third group. These were issues, such as tempos, that were best dealt with in one go rather than re-interpreting over the course of many years.

I often question whether this adaptation of Sonatas and Interludes will ever be “finished.” I doubt it, although upon completion of my doctorate I plan to not be spending upwards of twenty hours every week thinking about it. Just as a performer or conductor can release multiple versions of the same composition over their lifetime, I think it is valid that an adapter of music can also release multiple versions. I am certain that a hypothetical “Sonatas and Interludes: 20 Years On” would be very different to the version of today.
Chapter 1: Introduction

Topic Question

For the last fourteen years I have been adapting Sonatas and Interludes (Cage, 1960), a prepared piano composition by the twentieth century composer John Cage, for solo multiple percussion. This dissertation is an explanation of the process. The primary research question examined is: “how does one adapt a prepared piano composition for solo multiple percussion?” The process of adapting a prepared piano composition for multiple percussion is complex and multi-faceted, with decisions required of the adapter that are not usually raised in the adaptation process. This is primarily due to the fact that the prepared piano and multiple percussion are multi-layered timbre, rather than pitch-based instruments. Although pitched elements exist in both instruments, the main interest lies in the interplay between different timbres.

The research question can be reduced to a “source-process-output” paradigm, with Sonatas and Interludes being the source, adaptation being the process, and a solo multiple percussion work being the output. This paradigm is further developed in the review of relevant literature.

It is hard to disagree with Chadwick Jenkins (2009) who states that Sonatas and Interludes is “perhaps Cage’s most widely performed and appreciated piece as well as the magnum opus of the composer’s work for his ‘invented’ instrument” (p. 241). Dedicated to, and premiered in its entirety by Maro Ajemian, the work has been recorded dozens of times and has been the subject of several articles and dissertations, some of which are discussed later in this chapter.

This research project consists of two parts of equal importance. The dissertation unpacks and discusses areas of relevance to the prepared piano to multiple percussion
adaptation process. As a separate document, the appendix *(Sonatas and Interludes for Prepared Piano, Adapted for Solo Four, Five, and Six-Mallet Multiple Percussion)* acts as an example of how this adaptation process can be used to create a performable work. Together, the dissertation and accompanying score can be considered a case study for further research. Potential areas of future exploration of the topic are discussed in the conclusion to this dissertation, but could include other prepared piano works by John Cage and alternate composers as well as pieces for other timbre-based instruments.

The adaptation process will be discussed in the following chapters of the dissertation, with the output, the adaptation, being presented in the form of a musical score. These separate documents together provide a wealth of information that is beneficial for any musician contemplating working with timbre-based adaptations. For the purposes of this study the main body of original creative work is housed in the stand-alone score. The purpose of this dissertation is to provide a contextual framework and to unpack the methodology underpinning the adaptation process. To facilitate this, several musical examples are presented in the dissertation that are excerpted from the multiple percussion score. It should be understood that this research project does not extend to creating a performance, although technical problems inherent in multiple percussion performance were physically thought through in the adaptation process.

**Definitions**

*Grove Music Online* (Ripin & Page, n.d.) defines the prepared piano as:

A piano in which the pitches, timbres and dynamic responses of individual notes have been altered by means of bolts, screws, mutes, rubber erasers and/or other objects inserted at particular points between or placed on the strings . . . Since the tonal alteration desired varies from one piece to another and depends on the nature and placement of the objects used to effect it, these have to be indicated in the score. (para. 4)
The Oxford Companion to Music’s greatly abbreviated definition states that the prepared piano is “a piano in which the timbre has been altered by the insertion between the strings of bolts, screws, rubber erasers, and other objects” (Partridge, 2011, para. 1).

Both of these definitions are basically correct. Pritchett (1993, p. 24) notes some different ways of specifying preparations that differ from giving an exact placement. One such way employed by Cage is by providing a desired sound and leaving the placement to the performer’s judgement. However, the main complaint with the definitions given is their incompleteness. Just as the latter definition neglects to mention any alteration of pitches and dynamics, the former does not include any reference to the variation of sound from one piano to another. Additionally, its mention of “other objects” is a poor substitute for any discussion of the infinite variety of objects that can be used, or sounds that can be produced. The prepared piano is infinite in its possibilities, although trapped in a finite container. Throughout the dissertation I will demonstrate some of the complexities of working with the prepared piano as the source instrument for an adaptation, which will further expand on these definitions.

The etymology of adaptation is discussed at length in Chapter 2, so a brief definition will suffice here. For the purposes of this dissertation adaptation is defined as altering a work. This definition does not imply any change in instrumental forces or structure of the original. As timbre-based adaptation is a novel idea, the etymology and history is discussed in order to give historical context to the research.

Multiple percussion does not warrant a definition in either The Oxford Companion to Music or Grove Music Online. Nevertheless, the basic definition of multiple percussion is a group of non-homogenous percussion instruments played by one person in a single work. G. Cook (1997) states that “the playing of timpani, bongos, congas, or drumset is generally considered performance on one instrument” (p. 83). With the exception of the drumset, which
is a special case, the other examples are all examples of multiple homogenous instruments. Generally, more than one type of instrument is used, so a set of five temple blocks would not in itself constitute a multiple percussion setup. The wide variety of percussion instruments is noted by Holland and Page (n.d.) in *Grove Music Online*:

The development of music in the twentieth century has brought about a situation where any strange sound or sound effect not produced by conventional orchestral instruments ends up in the percussion section. (para. 3)

Whereas the prepared piano has infinite possibilities trapped in a finite container (that of the piano itself), multiple percussion could be defined as multiple infinites, percussion instruments being so vast in their variety.

**Methodology**

The methodology involved in the construction of this document has been both reflective and reactive. The reflective part of the research occurred due to the practical work (the adaptation itself) commencing in 2004, with my first clear writings on the topic dating from 2010. At this point the research consisted of collating various versions of the adaptation scores, program notes to my recitals, and annotations to present a clear evolution of my ideas over this time. The reactive part of the research consisted of my responses to various ideas that were either encountered through reading vast amounts of relevant literature, or through my own independent thoughts.

On various occasions the appended adaptation was rewritten, incorporating my most recent ideas regarding interpretation of the source material and notation method. There are five versions of my adaptation, outlined below. It should be noted that the titles of the various versions do not indicate the only differences between them.


This set of adaptations is incomplete, only containing four movements (*Sonatas IV, V, XIV, and XVI*). Each movement was notated in a manner suitable for a single movement
performance, with no consideration given to a united notation method. Scores were created using the music notation software, Finale.


This is the first complete set of movements. The instruments are set out on five staves, with a consistent notation system applied throughout the composition. All versions from this point onwards are notated using Lilypond, which is text-based notation software. The advantages of using Lilypond are the quality of the score graphics and flexibility of notation, with the main downside being the steep learning curve.

**Version 3: “Six Stave” (2012 to 2014)**

The instrumental setup is expanded, with the consequence that the use of only five staves is no longer feasible. The “percussion” staff is divided into “percussion” and “blocks.”


At this point I realised that I could not copy the dynamics across from the prepared piano score (see Chapter 3 for further explanation). The notation of dynamics prompted a rethink as to the notation of mallet numberings and these were rewritten at the same time.

**Version 5: “Undefined Instruments” (2016 to Present)**

This version is a minor edit of its immediate predecessor, in which the groups of instruments (temple blocks, tom toms, metal plates, etc.) are notated as high as possible if an incomplete set is used in a movement. For further information on this change, refer to Chapter 4.

It may seem that the latter four versions progressed at a steady rate every few years, but the similar amount of time spent on each version is purely coincidental. One factor that may have resulted in this is the sheer amount of effort needed to re-notate these revisions in Lilypond. After the first set of twenty adaptations took two years to complete, subsequent revisions have each required between two weeks and three months of nearly daily coding.
Scope

This document is designed to highlight some of the most important decisions made during the adaptation of *Sonatas and Interludes* for solo multiple percussion. While this information may be useful for musicians attempting similar feats, this document does not aim to be a comprehensive guide to adapting *all* prepared piano compositions, nor does it cover other timbre-based instruments such as vocal percussion. Rather, it unpacks issues encountered during the adaptation of *Sonatas and Interludes*, such as the interpretation of dynamics and pitched elements, as well as the notation of the percussion score. The dissertation does not discuss the adaptation process in a purely linear fashion. Instead, the chapters concerning terminology and dynamics are in-depth tangents of whose importance have become apparent during the adaptation process. These topics have not been researched extensively to this date, necessitating such deviations. Additionally, performance of the adaptation is not a part of this research project. It should be noted, however, that complex parts of the adaptation have been worked through physically in order to ensure that such a performance is possible. Finally, this dissertation does not discuss the interpretation of a prepared piano’s timbre and the subsequent substitution of a percussion instrument. Whereas areas such as dynamics, pitch and notation can be discussed objectively, I consider the choice of percussion instrument and its implement an intuitive one and any spectral analysis of prepared piano and multiple percussion tones falls outside the scope of this document.

Chapter Structure

This exegesis is divided into four parts. Part One provides an introduction to the dissertation. It contains my personal narrative (foreword), as well as the topic question, definitions, methodology, scope and literature review (Chapter 1). Having identified a clear lack of directly related literature, Part Two frames my research by providing an extensive history and rationale for the adaptation process (Chapter 2). The process itself is a
contentious part of musical production with arguments against adaptation being forthright, both throughout history and in my own encounters with other musicians. Therefore, it is important to lay out my justification for this research project. Part Three discusses some of the major issues raised in the adaptation process, concerning etymology and notation of dynamics (Chapter 3), pitch contour (Chapter 4), and multiple percussion notation (Chapter 5). These three broad areas allowed the most introspection as to how and why certain decisions were made. I believe that these areas will be of most use to musicians contemplating an adaptation of *Sonatas and Interludes* or any other timbre-based composition, as well as anyone interested in the complex nature of multiple percussion (either as a performer or composer). Part Four takes the results of these investigations, presenting two sections of the adaptation as a detailed example of its evolution (Chapter 6) as well as summarising my conclusions (Chapter 7). A separate appendix contains a complete, performable score of my adaptation of *Sonatas and Interludes*, including a detailed legend.

**Literature Review**

This section outlines the literature related to my dissertation topic. As there is a distinct lack of sources directly correlating to this research, the research question has been divided into three components, with subsequent discussion of the relevant literature in each of these three areas.

This thesis describes the adaptation for multiple percussion of *Sonatas and Interludes*, a prepared piano composition. Eduardo Leandro, a U.S. based percussionist, has transcribed (his word) some of the twenty movements, with YouTube videos available online (Leandro, n.d.). The main way in which Leandro’s work differs is that in these videos Leandro uses the prepared quarter tone marimba as his instrument, which places some limitations on the timbral possibilities.
Compartmentalisation

The literature can be compartmentalised into three main areas of study as demonstrated in Figure 1. These areas contain sources concerning *Sonatas and Interludes* (the original work), the adaptation process (the transformation) and multiple percussion (the finished product). These three areas are not commonly discussed together, which is one of the most distinctive aspects of this research.

![Diagram](Diagram.png)

*Figure 1. Research Question Dissection*

Before discussing these three areas and their corresponding bodies of literature, there is one source that combines multiple aspects of my research and is clearly related to my own research. Some of the Clocked Out Duo’s works have featured the combination of prepared piano and multiple percussion, with a reviewer noting that the “instrumental timbres are so well-suited” (Meggitt, 2010, para. 2). In agreeing with Meggitt, I would add that while there are sounds that are obviously produced by either the piano or percussion, some have an origin that is less clear. These sounds may be produced by the prepared piano, percussion, or some combination of the two instruments. An example of this is in the title track of *Water Pushes Sand* (Clocked Out Duo, 2002), where the origin of some of the sounds is ambiguous. One
example is a tone that has the timbre and attack reminiscent of a woodblock. It could be produced by a percussion instrument, perhaps a woodblock played with a softer than usual mallet. On the other hand the sound could be the result of a highly muffled upper register of the piano. The sonic characteristics of the two instruments can overlap to such an extent that entire ranges of sounds could be produced by either instrument.

**Sonatas and Interludes**

![Diagram of Timbre-based Adaptation: Rewriting John Cage’s *Sonatas and Interludes* for Multiple Percussion]

*Figure 2. Research Question Dissection (*Sonatas and Interludes*)*

Cage’s handwritten score was published by Peters over a decade after its composition (Cage, 1960). A brief overview of the prepared piano is given at the beginning of the document: “Mutes of various materials are placed between the strings of the keys used, thus effecting transformations of the piano sounds with respect to all of their characteristics” (para. 1). This is followed by the table of preparations, which precedes the musical notation. Some sections (bar 4 of *Sonata II*, for example) are quite difficult to read and early versions of the score were printed without a footnote in *Sonata XVI* that affects the performance of four notes. The 1993 printing of the score includes this footnote.

When adapting *Sonatas and Interludes* for solo multiple percussion, the score alone is not sufficient. As the adaptation is based on the sounds of the prepared piano, and considering that various pianos and preparations create differing sounds, one must also
choose a recording to base the adaptation upon. As Cage (Bunger, 1981) himself notes in the foreword to *The Well Prepared Piano*:

> When I first placed objects between piano strings, it was with the desire to possess sounds (to be able to repeat them). But, as the music left my home and went from piano to piano and from pianist to pianist, it became clear than not only are two pianists essentially different from one another, but two pianos are not the same either. Instead of the possibility of repetition, we are faced in life with the unique qualities and characteristics of each occasion. (p. 6)

The John Cage Trust (n.d.) maintains a list of recordings of Cage’s compositions. *Sonatas and Interludes* is particularly well represented, with recordings by such notable pianists as Maro Ajemian and Boris Berman. The recordings vary widely in their timbres and pitches, however, a few common elements, such as rhythms and unprepared pitches, unite them. The choice of recording for this research was that of Gérard Frémy (Cage & Frémy, 1980). The reason for choosing this particular recording was the percussive possibilities inherent in the timbres produced by Frémy’s prepared piano.

There are many pieces of writing concerning *Sonatas and Interludes*. As has been already noted, the composition is one of Cage’s more popular pieces and this is reflected in the breadth of available research.

*The Dance of Time – The Evolution of the Structural Aesthetics of the Prepared Piano* *Works of John Cage* (Rhodes, 1995) discusses three of John Cage’s prepared piano compositions: *Bacchanale* (the first prepared piano composition), *Sonatas and Interludes* (large-scale summation of prepared piano ideas), and *Music for Marcel Duchamp* (exhaustion of rhythmic ideas and increasing use of silence). While only selected sonatas are analysed, this source demonstrates how Cage’s prepared piano music was a direct result of his work with percussion orchestras which often incorporated multiple percussion setups.

*Cage’s Sonatas and Interludes for Prepared Piano: Performance, Hearing and Analysis* (Perry, 2005) demonstrates how the two ways of listening to *Sonatas and Interludes*, as a set of individual events and as a structural whole, can be reconciled. Perry uses two main
methods to analyse the works. Mathematically, the use of the square root formula, where the structure of the piece on a macro level is replicated on a micro level, is discussed along with the use of the golden ratio\(^5\) and the Fibonacci series.\(^6\) Melodically, the use of tonal centres is demonstrated, along with recurring themes in different keys. Timbre is not discussed in great detail, with diagrams discussing this essential element of prepared piano composition being conspicuously absent amongst the melodic annotations and matrices.

*Six Views of the Sonatas and Interludes* (Pritchett, 2005) considers the composition from multiple angles. Pritchett shows how one composition can be a part of multiple historical timelines. The research perspective put forward in this paper could be considered, in a condensed form, a seventh view of *Sonatas and Interludes*. In addition to Pritchett’s views of the composition “as a masterwork,” “as a meditation,” “as a new musical resource,” “as rasavant music,” “as a transforming experience: a journey,” and “as a work in progress,” one more can be added, “as a timbre-based composition.”

*The Prepared Piano of John Cage: A New Level of Hearing the Sonatas and Interludes* (Ferreira, 2010) is novel, both in terms of chronology and its approach to *Sonatas and Interludes*. The sections concerning history of the prepared piano and preparation of the piano contain little new information. However, the analysis of preparation material in a “color table” is interesting, as is the investigation of location (either in terms of audience or microphones) in relation to perception of prepared piano tones.

In the preface to his 1992 biography of Cage, David Revill wrote that “there has been no general book-length account of [Cage’s] life, work and thought” (p. 3). Fortunately, many books discussing these aspects (either individually or together) have been written since,

\(^5\) The golden ratio is the division of an object into two parts, where the ratio of the larger part to the smaller part is the same as the ratio of the entire object to the larger part.

\(^6\) The Fibonacci series commences with 1, 1. The subsequent numbers are determined by adding the two previous numbers. The first 10 numbers of the Fibonacci series are: 1, 1, 2, 3, 5, 8, 13, 21, 34, and 55.
including those by Pritchett (1993) and Nichols (2007). While these books have all been enlightening, their discussion of *Sonatas and Interludes* is brief by necessity and therefore most of the specific information regarding the composition is better acquired using the articles discussed previously.

Collections of shorter writings about Cage also exist. Some of these, such as *The Cambridge Companion to John Cage* (Nichols, 2002) include detailed discussions of *Sonatas and Interludes*. Others, such as *A John Cage Reader* (Brent & Gena, 1982), do not.

While there are many analyses of *Sonatas and Interludes*, an adaptation adds to the literature by creating a practical, playable analysis. As the adaptation is based on one recording, the tonality of the composition was able to be enhanced through use of pitched elements that do not appear in all recordings. This is discussed further in Chapter 4.

**The Adaptation Process**

![Timbre-based Adaptation: Rewriting John Cage’s *Sonatas and Interludes* for Multiple Percussion](image)

*Figure 3. Research Question Dissection (Adaptation Process)*

The genre of works pertaining to adaptation can be roughly divided into three groups: those discussing adaptations in general, those that concentrate on a specific subset of adaptations, and those that discuss the author’s own adaptations.
Adaptations, and whether they should be allowed to exist, constituted a lively if sporadic debate during the end of the nineteenth century and the beginning of the twentieth. On one side of the argument were those who detested adaptations of any type, such as Lunn (1875) who thought that “musicians, of course, do not want them” (p. 773). Considering the immense popularity of adaptations in the nineteenth century, it would be interesting to know how Lunn would have described the purchasing public. An article, in the “Occasional Notes” (1892) section of *The Musical Times and Singing Class Circular* managed to both agree with Lunn and comment on the ubiquity of adaptations: “The history of arrangements, or derangements, of musical compositions has yet to be written, and if any such work fails to see the light it will not be for lack of material” (p. 532). These arguments are supplemented by those that took exception to certain aspects of adaptation. The lack of explicit indication of a work’s contents annoyed some writers. One article (Occasional notes, 1881) voiced frustration with adaptations that didn’t indicate the original instrumentation, while another (Occasional notes, 1882) expressed a wish that pieces advertised as a certain composition did not contain fragments of others. Cellier (1925) appears conflicted in his argument. While admitting that a “superb orchestration” of a Chopin polonaise was “really superior to the pianoforte version,” he states that adaptations “could lay claim to no rôle of first-rate importance, such as composition or actual playing” (p. 900).

Counter arguments do not present a diametrically opposite view, that is, they do not state that adaptation is agreeable or appropriate at all times. Rather, they tend to argue that in certain circumstances an adaptation is a musically valid work. One such proponent notes that “the subject of Arrangements is one that never fails to stir the bile of the musical critic, though it is hard to see why” (Occasional notes, 1891, p. 533). However, the author is also critical of certain examples of the genre (primarily sets of quadrilles based on operas).
Warrack (1944, 1945), while emphasising the positive qualities of adaptation, is also careful to delineate between so-called “good” and “bad” adaptations.

If Lunn’s premise, that musicians do not want adaptations, is accepted, then this document is either an invalid project, or otherwise aimed at people who are not musicians. This brings to mind John Cage’s view on musical semantics: “If one feels protective about the word ‘music,’ protect it and find another word for all the rest that enters through the ears” (Fisher 1998, p. 167). Chapter 2 of this document will highlight some of the various uses of adaptations, justifying both their existence and that of this dissertation.

Reflective discussions of adaptations generally concern subsets of the overall genre. A large number of these focus on the piano in the nineteenth century. The reason is clear; at no other time and for no other instrument was the adaptation process so ubiquitous. The beginning and end of the nineteenth century neatly bookend two events that are entwined with the piano adaptation’s popularity. The beginning of the century saw the rise of the middle class and mass production of the piano create a huge market for adaptations, whereas the end of the century witnessed the advent of recorded sound and the usurping of many of the utilitarian roles of adaptations. Even if Lockhart (2002) is correct in stating that “keyboard arrangement has not received the historical attention. . . that it deserves” (p. 7), there are still some valuable sources.

Christensen has written two pieces on subsets of the adaptation genre. The first (Christensen, 1999), focuses on four-hand (one piano) adaptation in the nineteenth century and discusses its value in distilling orchestral music into a domestic setting suitable for amateurs, while the second (Christensen, 2000), discusses the reduction of an opera to a piano-vocal score. Lockhart’s (2012) dissertation, *Listening to the Domestic Music Machine*, features a strident defence of adaptation (including naming and shaming certain books that neglect the genre), followed by piano adaptation’s role in nineteenth century music.

A large number of writings during the last forty years have been produced by active adapters, usually focussing on a small subset of the adaptation genre. In general, these writings summarise the history of the subset in question and then confront difficulties in translating the music from one form to another.

These subsets are quite wide in scope. They can have clearly defined source and target instruments, for example the dissertations by Kono (2002 - cello to tuba), Swanson (2003 - clarinet to viola) and Serrano (2016 - lute to guitar). Others use their own instrument as the target, but do not specify one source instrument. Examples of these works are dissertations by Harb (2014 - guitar), Bogert (2013 - strings to baritone saxophone), Lee (2005 - viola), and Galvin (2013 - viola). Adaptations need not be for a solo instrument. Ensembles are represented in the literature, with dissertations by Abbott (2001 - guitar and piano duo) and DeSarno (1994 - brass band to wind band) being examples. DeSarno’s is the only one of these to include percussion. While she investigates the cadential use of percussion in others’ adaptations, in her own example the percussion parts are left unaltered.

Other works on adaptation are a little more unusual. Robinson (1980) discusses constructing organ accompaniments from orchestral scores and piano reductions. Bieber (1997) is not limited to classical music as a source, using world music instead, whereas Yong (2006) discusses electro-acoustic music in his article on adapting Scelsi’s Aitsi (for amplified piano) for piano with computer. There are numerous works that discuss adaptation in the context of jazz and popular music, which fall outside the scope of this study.

None of this research discusses the adaptation process from one timbre-based instrument to another. There is, therefore, a gap in the adaptation-based research which this
The study, preparation, and performance disciplines of multiple-percussion performance are unique among the percussions” (G. Cook, 1997, p. 83). Multiple percussion, put simply, is the use, by one person, of multiple percussion instruments in a single work. This simple definition belies the complexity of writing for and performing on the instrument. There are numerous sources on which the research relies. These can be divided into two main categories: reference material (where multiple percussion is discussed along with other
percussion instruments such as the marimba and timpani) and notation texts (which may concern percussion in general, or focus on multiple percussion).

*Percussion Instruments and Their History* (Blades, 1992) includes multiple percussion in several parts of the chapter entitled “Composers’ Use of Modern Percussion.” It is unusual in that multiple percussion is discussed in and amongst other percussion instruments. Blades provides a succinct list of firsts and notables, and briefly discusses the lack of percussion notation standardisation.

*Teaching Percussion* (Cook, 1997) presents multiple percussion as a distinct instrument, with its own notational and logistical (not to mention pedagogical) problems to be solved. Each issue is discussed clearly, with musical examples included to specifically illustrate the intended point. At only fourteen pages, it is brief (especially in comparison with other instruments such as marching percussion, which is afforded 83 pages). However, this text is a most useful discussion of multiple percussion, secondary only to sources dedicated to the subject.

*The Percussionist’s Art: Same Bed, Different Dreams* (Schick, 2006) is a long overdue detailed exposition on the intricacies of multiple percussion performance. The use of determinate indeterminacy in certain percussion compositions allows the performer to take on some of the roles traditionally assigned to a composer – or adapter. Schick’s book is very useful due to its discussion of *The Anvil Chorus* and *Bone Alphabet*, two compositions with non-fixed instrumentation. Schick discusses the choice of instruments in relation to each other’s timbres, as well as the placement of instruments in order to facilitate movement between them. These considerations are vital in the construction of setup diagrams (should these be used in the composition process).

As Spohn (1953) clearly states: “Before music can be performed well it must be properly notated” (p. 1). Many of the issues confronting multiple percussion notation are
those of percussion notation in general. Writings on percussion notation have generally lamented the disorganised, unstandardised and in some cases unintelligible examples of percussion notation. Some have attempted to present a coherent notation system for use by composers and adapters. One method of achieving this is by synthesising ideas from currently accepted practice, as Spohn (1953) or Marini (2016) have done.

Spohn’s dissertation is outdated in many areas, which is to be expected, considering its age and the rapid change of percussion instruments and their notation. For example he states that the marimba is only notated using the treble clef. Additionally, Spohn did not have the benefit of referring to supplementary texts, such as Beck’s (1995) Encyclopedia of Percussion or Blades’s (1992) Percussion Instruments and Their History. As a result of this, Spohn is forced to define many of the instruments he covers, leaving less room for discussion of notation. This dissertation could have been more helpfully titled “Writing for Percussion” rather than “Notation for Percussion Instruments” – a subtle but important difference.

As can be expected, Marini’s (2016) dissertation is much more up to date. Not only does it make suggestions as to percussion notations, but it puts them into practice, presenting a re-writing of the percussion parts of Robert Beaser’s Manhattan Roll. By definition, this dissertation concentrates on ensemble notational issues, however, a lot of the ideas can be translated to multiple percussion notation. Arguments can be made against some of the text. For example, in a sample legend (p. 18), two instruments share a single space in the staff where some lines are left unused. However, in general this is a well thought out and clearly presented document.

Standardization of Percussion Notation (Percussive Arts Society, 1973) is a short explanation of how percussion parts should be laid out. The authors make some excellent points, such as the ambiguity arising when a roll is not tied to a note. Marini (2016) states that
this booklet is a “wonderful starting point” (p. 9). Despite its extreme brevity, it is hard to disagree.

_A Survey of Multiple Percussion Notation with an Emphasis on Timbre Staff Notation and Setup_ (Julian-Jones, 2005) is invaluable to anyone considering writing for multiple percussion. The first half of the dissertation is dedicated to an explanation of all popular notation systems for multiple percussion, ordered chronologically. Each of the systems contains an example of its use in a well-known composition. However, the source’s greatest value lies in the clear explanation of the positives and negatives of using each style of notation. Julian-Jones also shows how the prepared piano can be considered the ancestor of timbre staff notation, through the distinction between a note’s location on the staff and its actual pitch.

_An Examination of Notation in Selected Repertoire for Multiple Percussion_ (Smith, 2005) is similar to Julian-Jones’s work in that it inspects various styles of notation through well-known examples. The distinction between the two is that while Julian-Jones discusses the positives and negatives of each style, Smith is more critical of composers when their choices appear illogical or ill-informed.

The third dissertation concerning multiple percussion notation is _Multiple Percussion Notation: The Effectiveness of Three Types of Staff Notation on Sight-Reading Ability_ (Kamstra, 2006). This source is least valuable in the scope of this research as the _Sonatas and Interludes_ adaptation is not intended to be sight-read. However, Kamstra does cite certain historical examples not present in other sources and also discusses the spatial inefficiency of using seven natural notes and five accidentals per octave and how this relates to timbre-staff notation.

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8 Timbre staff notation is where the instruments in a multiple percussion setup are arranged in a layout similar to that of a piano or marimba keyboard, with two rows of instruments representing the naturals and accidentals. This style of music notation is most commonly associated with the music of David Hollinden.
Multiple percussion notation has been discussed extensively over many years. However, this dissertation includes extremes of instrumental setup and number of movements. This prompts further questions which are not yet covered in the existing literature. Additionally, my research adds to the discussion of adaptation by being timbre based, rather than purely pitch based. Adapting a composition for a primarily timbre-based instrument, such as the prepared piano, prompts questions that are not required in a conventional instrumental adaptation. These questions are answered throughout the dissertation.
Chapter 2: Adaptation –

Etymology and Rationale

It will perhaps scarcely be credited that I once saw the Overture to “Der Freischütz” arranged for two guitars. I have much pleasure in adding that I did not hear [emphasis added] it. (Lunn, 1875, p. 773)

There is also a case directly refuting the arguments against arrangements, for it may be contended that some music sounds better in its new guise. (Warrack, 1944, p. 361)

Few areas of musical activity involve the aesthetic (and even the ethical) judgment of the musician as much as does the practice of arrangement. (Boyd, n.d., para. 19)

The subject of this dissertation is timbre-based adaptation, with the output of the source-process-output paradigm being the accompanying stand-alone score of my adaptation of Sonatas and Interludes. This chapter will discuss the historical and etymological perspectives towards the altering of an original work to create something different. Given the contentious nature of the act of adaptation itself (as is briefly alluded to in the previous quotes and discussed more critically later), this chapter will also justify the existence of this research project.

Compared to original compositions, adaptations are somewhat neglected in academia and scholarly research. Cellier (1925) has noted that transcription is “not often critically examined” although it is “an extremely well-known musical form” (p. 900). Lockhart (2012) is more detailed – in bold print he writes: “the practice of keyboard arrangement has barely been investigated by historical musicology” (p. 7). This statement is reinforced by his citations of writings concerning the piano, nineteenth century music, and nineteenth century
piano music, noting the lack of attention given to the keyboard arrangement. This was not
due to a lack of non-original works – over a third of the compact discs contained in “The
commences his dissertation on adapting music for the guitar with the following: “The art of
arranging or transcribing music from a single instrument to another has not been taught
formally and systematically, nor has it been included as a course of study in the curricula of
great music schools and conservatories” (p. 1). Even reference works of the late eighteenth
and early nineteenth century regularly neglect mention of any words concerning the process
of adaptation.

Along with humorous approaches to this process, such as Curious Arrangements of
the Hallelujah Chorus (1901), there are a few genuinely insightful works which are
thoughtful and balanced in opinion. These include a two part series entitled ‘Arrangements
Have Been Made’ (Warrack, 1944, 1945) and Lockhart’s Listening to the Domestic Music
Machine: Keyboard Arrangement in the Nineteenth Century (2012). However, these appear
to be limited in number.

The idea of adapting works of classical music to purposes other than how the
composer may have imagined is not a universally welcomed concept. Lockhart (2012)
believes that “suspicion dogs those who seem to make too great a use of [adaptation]” (p. 19),
while Galvin (2013) sums up the negative opinions succinctly: “One of the more
controversial aspects of the music performance world is the transcription. Some consider
them contrary to the composer’s original intention. Others consider them not far from
thievery” (p. 1). Very few would attempt to justify thievery, however, is deviation from the
composer’s intent such a crime? Is the composer’s finished work always perfect? From reading some arguments against adaptation one could easily believe that this is the case.

Quantz (1985) states that “writing a solo today is no longer considered an art. Nearly every instrumentalist tried his hand at it. If he has no inventiveness of his own, he helps himself to borrowed ideas” (p. 318). Cellier (1925) notes that transcriptions “could lay claim to no rôle of first-rate importance, such as composition or actual playing” (p. 900). A recent retrospective view by Lockhart (2012) is that “arrangements in the last hundred years have been almost exclusively criticised or dismissed as questionable acts of infidelity against a composer’s intentions” (p. 54). It appears that the attitude towards adaptation as being second-best has endured throughout most of classical music history.

As well as adding to the relative paucity of writings concerning the adaptation process, this chapter will demonstrate the validity of adaptations by discussing, in some detail, their uses over time. Some writers have claimed that adaptations by renowned composers are superior, especially adaptations of their own compositions. Wherever possible, adaptations by well-known composers will be cited, however it is not the aim of this study to equate adaptation ability with compositional ability.

The validity of adaptations is not the only area requiring clarification, as the etymology of the adaptation process is also very confusing. To address this, a section regarding the word usage of musicians concerning adaptation will help define terms as used in this discussion.

**Etymology**

The etymology of the term adaptation is complex as the English language is full of words to describe alterations to an original work. Arrangement, transcription, paraphrase,

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9 The use of the word “crime” may seem excessive, but such language is not without precedent. Lunn (1875) asks “is it not somewhat criminal to allow such garbled versions of standard works to grow up around us without a word of discontent?” (p. 773) and Warrack (1944) refers to “the anti-arrangement cult” (p. 361).
retouching, variation, edition, and version are used in various ways to name but a few. It is useful to attempt to understand some of the more common terms - arrangement, transcription, and to a lesser extent, paraphrase. The latter term is used almost exclusively in relation to keyboard instruments. Out of the 530 works categorized as such in the Petrucci Music Library (n.d.), an online, searchable collection of public-domain scores, 521 include a keyboard part. Paraphrase is included in this study as it is often mentioned in relation to the other two terms. It should be noted that jazz and popular music have their own terms for various adaptations of an original work. Some of these are shared with classical music while others are unique to the genre. Transcription, for example, is used in classical music and jazz whereas cover version is used in relation to popular music. The etymology discussed in this project only applies to classical, or Western Art Music.

The process of adaptation can vary in degree of faithfulness to the original, as Lockhart (2012) explains: “An arrangement without fidelity is a free composition; an arrangement without deviation is the original work” (p. 30). Arrangement, transcription, and paraphrase have had distinct definitions and at various times the relationship between the terms has changed. It makes sense to categorise the various degrees of digression from the original, but how many categories should there be, and where should the lines be drawn, if at all?

This question of terminology regarding adaptations is not a new one. The American Choral Directors Association (ACDA) attempted to improve the standard of (mainly early music) publications through the Choral Editing Standards Committee (CESC), which functioned from 1966 to 1983. These efforts were documented at the time through articles in the ACDA’s publication, The Choral Journal. Additionally, Goss (2013) has provided a summation of the committee’s work in a recent dissertation. Amongst the committee’s recommendations was a precise adherence to their definitions of arrangement, transcription,
and edition (Choral standards editing committee 1968). According to Goss (2013), the ACDA, having failed to make an impact on publishers with this resolution, worked with the Music Publishers Association (MPA) in the 1970s on a new pamphlet, and in 1982 this work was published in The Choral Journal (Recommended editorial standards for choral publications, 1982).

Unfortunately quantification of the success or failure of this initiative is limited to Haberlen and Mathis (2009) who note that “publishers became aware of the need for artistic/authentic editions that were selected for use at ACDA interest and reading sessions” (p. 14). According to Bauchspies (2015), “it is difficult to demonstrate the efficacy of these efforts” (p. 42), whereas articles in The Choral Journal by Marvin Latimer mention the 1968 resolution without discussing any results (Latimer 2008, p. 54; 2010, p. 42). There are some distinct differences between choral and instrumental music, notably that “unlike Urtext editions of orchestral and piano works that began to appear after World War II, very few similar editions of choral works existed” (Bauchspies, 2015, p. 41). This lack of authentic choral scores providing the impetus for etymological reform was simply not paralleled in instrumental music. Nonetheless, any results deriving from the experiment would have been valuable.

Three groups of sources are relevant to this area of investigation. Firstly, a study of reference works shows the development of the relationships between the terms. The New Grove Dictionary of Music and Musicians and its predecessors, Grove’s Dictionary of Music and Musicians and A Dictionary of Musicians, allow an evolutionary view of the definitions over more than 125 years. The second group of sources, recent articles and dissertations, help frame the current use of terminology relating to the process of adaptation. Finally, a brief study of terminology use in current concert programmes shows how practising musicians are employing the vocabulary.
Keller (1969) uses two dictionary definitions to introduce his article on the rationale of adaptation. The two that he selected have marked similarities, using “virtually the same words” (p. 22). This similarity highlights any differences between them. In this particular case, the time span between Riemann’s (1882) Musiklexikon and Apel’s (1944) Harvard Dictionary of Music saw the rise of the gramophone record and the decline of the piano reduction. Keller explains that whereas Riemann could use the latter as an example for readers, Apel is forced into a comparison between arrangement and translation. This divergence by Apel provides an introduction to Keller’s thoughts about the comparison between music and language.

This discussion attempts a similar feat, that is, a comparison between dictionary definitions. However, whereas Keller used the sources that suited his article, the following are primarily from The New Grove Dictionary of Music and Musicians. The fact that in many cases the entries have been copied from one edition to the next with minimal changes highlights the importance of these differences. Additionally, the use of one source that covers over 125 years’ evolution of academic ideas over many editions is valuable.

A surprising fact is that although all three terms were in common usage during the nineteenth century, not all of them appear in all reference books. For example, A Dictionary of Music and Musicians (1879-90) contains no entries for paraphrase or transcription. Grove’s Dictionary of Music and Musicians (1904-10) adds an entry for transcription, but paraphrase is still absent. By 1954, all three terms are afforded an entry, but those for paraphrase and transcription are as limited as could be possible, simply referring the reader to the entry for arrangement. The New Grove Dictionary of Music and Musicians (1980) contains entries for all three terms, although the entry for transcription is still only one
sentence long. This is still the case with *Grove Music Online* today. This practice is not limited, however, with the *Oxford Companion to Music* using the subject heading “Arrangement or transcription” in various editions. It should be noted that although some terms lack a subject entry, they are sometimes mentioned under other headings.

The comparison between the terms *arrangement*, *paraphrase*, and *transcription* is interesting as it is quite inconsistent over time and even between contemporary publications. Although *transcription* does not appear under its own heading in *A Dictionary of Music and Musicians*, it is mentioned under *arrangement*, in the following phrase:

> Beyond that lies the danger of marring the balance of the original works by undue enlargement of the scale of particular parts, of obscuring the personality of the original composer, and of caricature, - that pitfall of ill-regulated admiration, - instances of which may be found in modern ‘transcriptions,’ which are the most extreme advance yet achieved in the direction of freedom of interpretation. (Parry, 1879, p. 93)

Whether Parry considered transcriptions less true to the original is debatable. A few sentences earlier, he had written that “the tendency of high class modern arrangements is towards freedom of interpretation” (p. 93), meaning that he may have considered the terms *transcription* and *arrangement* synonyms. Lacking a direct comparison, any conclusions are purely conjecture.

Fuller Maitland, the editor of *Grove’s Dictionary of Music and Musicians* (1904-10) provides such a comparison, stating that the terms should be synonyms, but that transcription “implies a different, and in most cases a far less worthy production, since the transcriber rarely if ever fails to add something of his own to the work he selects for treatment” (Fuller Maitland 1910, p. 140). A second type of transcription, that of a reduction to solo instrumentation for the benefit of students, is considered more worthwhile.

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10 The terms *paraphrase* and *transcription* often have alternate definitions not related to adaptation. These have been ignored in this dissertation.
The 1954 edition of *Grove’s Dictionary of Music and Musicians* provides a clear comparison between *arrangement, paraphrase* and *transcription*. It is succinct enough to be reproduced in its entirety:

Arrangement may be said to differ from “transcription” by being a more literal reproduction of an original, the latter term being understood to mean an adaptation more intimately suited to the nature of the new medium, taking greater liberties with the original, but not treating it as freely as would be done in a paraphrase. (Borwick, 1954, p. 223)

This places the three terms in descending order of fidelity to the original as being *arrangement, transcription, and paraphrase*.

*The New Grove Dictionary of Music and Musicians* of 1980 provides another clear comparison between terms, yet in this case *arrangement* is considered more of a catch-all term, with *transcription* (greater adherence to the original) and *paraphrase* (freer interpretation) being subcategories. It notes that “the distinction implicit here between an arrangement and a transcription is by no means universally accepted” (Boyd, 1980, p. 627), citing the contradictory definition in the dictionary’s previous edition. This comparison, along with the citation of the 1954 edition, is carried over into the 2001 edition as well as to *Grove Music Online*.

The *Harvard Dictionary of Music* of 1944 does not provide a direct comparison between any of the terms, however it is noted that arrangements vary “from simple transcriptions in which the musical substance remains the same but is transferred to a new medium, to the complete reworking of a piece with additions and modifications” (Apel, 1944, p. 54). One could infer a similar view to that of the 1980 version of Grove, but this interpretation is at odds with the 1954 Grove as to whether the term *transcription* implies more or less fidelity than usual. Any reference to a comparison between *transcription* and *arrangement*, direct or implied, is absent from the 1970 edition of Harvard.
The Oxford Companion to Music (Whittall, 2002) provides a different comparison between transcription and arrangement, stating that transcription refers to the copying of music, changing the layout – in other words, changing the look without changing the sound. Arrangement, on the other hand, changes the medium. It is a completely different view to the other reference works already discussed and also raises some questions. For example, what would Whittall consider Godowsky’s Studies on Chopin’s Etudes, in which the instrumentation (solo piano) is maintained, but the music is made more complex?

In summary, there is little doubt that paraphrase is considered the freest of the various types of adaptations. It appears that the view tends towards transcription being the strictest version, although whether arrangement is an overarching term encompassing the other two, or merely a type of adaptation between transcription or paraphrase on the continuum of fidelity is unclear.

There are two common approaches to the issue of etymology in scholarly writing. The first is to choose one of the terms and use it universally throughout the article or dissertation. This rationale is either explained, as by Galvin (2013, p. 3), or not discussed at all. Where the etymology is not covered, one can only guess as to the intentions, although it is extremely unlikely that these authors had two distinct definitions in mind and only ended up discussing arrangements or transcriptions. The confusion between the two terms is highlighted by Shelton (2010), who uses the term transcription universally, even though he admits that one of the works cited is “more of an arrangement” (p. 16).

Another common approach is to use various terms interchangeably. Authors such as Bogert (2013) and Hannifan (2010) do not provide clear definitions in their work, yet their interchangeable use of the words arrangement and transcription when discussing the same work or concept indicate that they consider these words synonyms.
The linking characteristic between these two approaches is that they neatly disregard the need to differentiate between transcriptions and arrangements, therefore “avoiding the problem” (Chu, 2012, p. 9). However, this approach is not universal.

Pierce (2011), on the other hand, devotes over three pages to various definitions of the terms, before concluding that there is considerable confusion between them. He employs a third term, paraphrase, which is rarely discussed in other recent dissertations and articles, to refer to “the freest type of reworking of previously composed material” (p. 13). Not only does Pierce state that he will be using the terms paraphrase and transcription in his dissertation, he explains that the default term for an adaptation is transcription and makes paraphrase a carefully defined exception.

The understanding of how specific terms are used in scholarly writing is valuable. However, the real-world usage of these terms is worthy of investigation also, even if in lesser detail.

Edition Peters (n.d.) uses arrangement, transcription, paraphrase and adaptation on their website. Universal Edition (n.d.-a) also employs all four terms, although it is interesting to note that a collection of pieces is described as both “adaptations of the classics” and “first rate arrangements” (Universal Edition, n.d.-b). Boosey & Hawkes (n.d.) uses the same four terms, although there was no use of adaptation in a solely instrumental work titled in English.

A quick survey of the 2016 season programmes for professional orchestras in Australia (Adelaide Symphony Orchestra; Canberra Symphony Orchestra; Melbourne Symphony Orchestra; Queensland Symphony Orchestra; Sydney Symphony Orchestra; Tasmanian Symphony Orchestra; West Australian Symphony Orchestra) revealed an almost unanimous use of the term arrangement (or its abbreviation), with a few uses of the term orchestration. There was no reference to transcription. Additionally, some pieces are listed as arranged and orchestrated in different places, for example, Julian Yu’s adaptation of Berg’s
Piano Sonata, in the Melbourne Symphony Orchestra’s season programme (Melbourne Symphony Orchestra, 2016).

As has been shown, there is still a wide range of opinion as to the precise definitions of the terms *paraphrase*, *arrangement*, and *transcription*. There is a general understanding that the terms, presented in the order just given, represent an increasing level of fidelity to the original. Furthermore, there will not likely be any imperative in the future to create specific definitions and it appears that the best way to move forward is to accept the terms as synonyms. To avoid confusion, the word *adaptation* is employed throughout this dissertation.

**Rationale**

Why adapt a work? According to Warrack (1944), “the best answer is the simple one ‘Why not’ – provided the arrangement is a good one. Besides, there is a large class of arrangements that fulfils a specific, constructive purpose” (p. 361). It is this class of adaptations that will be discussed. Davies (1988) provides four reasons why transcription should be interesting to the musical researcher. These are pedagogical, easy dissemination of the transcribed work, analysis of the transcribers’ skill, and as an observation on the original. The number of reasons is low primarily because he has a very specific definition of transcription as a more faithful type of musical adaptation:

> It is not sufficient that the composer of transcriptions take a work as his or her model and that this model be acknowledged in the resulting composition. The composer of *arrangements on*, *variations on* and *homages to* does this much without producing transcriptions (p. 218).

The number of justifications for adapting an original work have been limited to five, in order to allow more detail than would have been possible otherwise. One of the most important reasons to adapt is to provide repertoire where original compositions do not exist in sufficient numbers. This is most obviously the case in regard to recently invented instruments. As Kono (2002) notes in his dissertation on transcription to the tuba:
Commissioning new works from composers can help, but such a method will be costly and unreasonable for producing a large quantity. The financial requirement of a transcription will be far less and the difficulty level can be varied by making proper adjustments during the process of transcribing. (p. 6)

The saxophone, also an invention of the nineteenth century, derived considerable publicity from Berlioz’s writings. However, Berlioz also assisted in a musical sense, adapting his own *Chant Sacré* for saxophone ensemble.

An additional advantage to using adaptations rather than original compositions is that familiar works are far more likely to allow the listener to concentrate on the novelty of the instrument, rather than that of the composition. This is evident at a demonstration of the theremin, at which no original works were performed (Wireless music, 1927). Not all new instruments are as long-lived, an example being the pyrophone, an instrument based on the noises generated by gas flares. A demonstration of a prototype included a rendition of *God Save the Queen* (France, 1876).

If, unlike the pyrophone, an instrument survived, there would generally follow adaptations allowing the instrumentalist to perform music from previous eras. There are baroque and classical adaptations for instruments developed in the nineteenth century, such as the saxophone, euphonium, and tuba. The classical marimba, a twentieth century instrument, has had music adapted for it to allow performers to play music from as many musical eras and styles as the violin.

In certain periods of musical history, some instruments’ repertoire has consisted almost entirely of ensemble rather than solo works. According to Lee (2005), there was little solo repertoire available to the players of the viola for two hundred years up to the end of the eighteenth century. This has resulted in numerous adaptations of baroque and classical era music in order to expose violists to solo repertoire of that style. Another example is the tuba, an 1835 invention, for which “there are virtually no solo works for the instrument written in the 1800s” (Kono, 2002, p. 1).
It can be inferred that adaptation is not limited to solo instruments, as all of the previously mentioned justifications for adapting an original work can be applied to ensembles. Warrack’s (1944) claim that “if you wished to perform Ravel’s ‘Daphnis and Chloë’ on piccolo, sarrusophone, double bassoon and harmonium, you would probably find an arrangement ready made” (p. 363) is a little farfetched, although there are likely more adaptations for this combination than original compositions. The more obscure the combination of instruments, the less likely that someone has already composed for it. Short of creating new compositions through the ensemble members or via commissions, adaptation is the only way of acquiring repertoire. For example, Die 12 Cellisten der Berlin Philharmoniker (n.d.-a, n.d.-b) lists approximately twice as many adaptations as original works on their website.

It could also be stated that a kind of antithesis of these examples also exists, that of using adaptation to save music written for obsolete instruments. The arpeggione, a string instrument described as “all but extinct” (Antipa, 2015, p. 10), has been kept alive in the collective musical consciousness primarily due to Schubert’s sonata for the instrument. Adaptations of this composition exist for woodwind, brass and string instruments.

There have been some examples in which the adapter has consciously attempted to improve upon the original. The first justification for this is that the adapter considered the composer’s realisation of their ideas as unsatisfactory. Busoni’s version of Schoenberg’s second piece of Drei Klavierstücke Op. 11 (Three Piano Pieces), in which the former claimed to the latter that he had “penetrated so deeply and closely into your thoughts” (Beaumont, 1987, p. 386), is a prime example, as there is correspondence between the two regarding the process. It appears a little farfetched for Busoni to claim such a high level of understanding, but this rationale is not unique.
Brent-Smith (1922) believed that a transcription could be superior to the original through no fault of the composer’s technique, rather because their original musical conception was inadequate:

Transcriptions are frequently not the next best thing; but, if anything, just one better. Composers do not always write their music for the best medium. It may be that they write a solo Violin Sonata to please a friend, but the music they write may be better expressed as a Pianoforte Sonata; therefore transcribe it. (p. 169)

This appears to be a reasonable opinion, although Brent-Smith continues on to argue that Bach needed the modern piano in order to realise his ideas, settling on the organ as it was the best instrument that he had. In arguing that “the transcriber is but restoring the composer’s thoughts” (p. 169), Brent-Smith sounds strangely like Busoni, an adapter whose style he denigrates in his article.

Another justification for adapting in order to improve the original is to take advantage of improvements in instrument design. A prime example is the flute, which changed considerably in the first half of the nineteenth century. As noted by Hamilton (1984):

It is obvious that Beethoven composed for a flute not capable of producing notes above A_3^3 under any circumstances. Often A_3^3 and Bb_3^3 are avoided in the flute part, even at the cost of octave displacement or interchanging voices within a prominent melodic line. (p. 109)

This range limitation is discussed by Wagner (1966), in his article regarding suggested edits to Beethoven’s ninth symphony. These edits were the basis for performance alterations by von Bülow, Strauss and Mahler, amongst others (Knittel, 2006).

As has been noted, it is not uncommon for adapters to claim understanding of the thoughts of the composer through their music, but in the case of Schumann’s ‘Spring’ Symphony we actually know for certain what the composer originally intended. In the first two bars Schumann wrote notes for the trumpet and horns (at the time, valveless instruments) that were unplayable (trumpet) or playable only when using hand muting, which created an unsuitable timbre (horns). Mendelssohn transposed the notes up a third and this is where they
are played today. Jensen (2001) asks a pertinent question: “Now that Schumann’s original passage can be played with the effect he intended, should it be restored in the score?” (p. 202)

It appears that Mahler thought so, as he moved these notes back to their original position.

Another “instrument” that evolved considerably throughout the nineteenth century was the orchestra. It has been a long held view that Schumann’s orchestration technique was deficient. However, it is now thought by some that this is due to the size of the orchestra that he composed for. Not only did the orchestra grow during the nineteenth century, but the proportions of the various instrumental groups changed: “When Schumann’s ‘Spring’ was first performed in 1841 the woodwind-to-brass-to-string ratio was 1:1:3. When Mahler conducted the ‘Spring’ approximately 60 years later in 1899 the ratio was 1:1:4 – a 33% increase in the strings” (Franke, 2006, p. 84). This change in orchestral balance had to be reflected in Mahler’s adaptation.

Another justification for adaption is to increase a person’s exposure to music. Today, accessibility to classical music is easier than ever before. One can download enough music to last an entire lifetime in a matter of hours. Consequently it can be easy to forget that the phonograph, and therefore the entire history of practical recorded sound, is less than 140 years old. Before recordings there were two ways of hearing music and the only difference between them was whether the listener was also a performer.

Considering ensemble music, the opportunity to listen to a favourite composition was even less likely. One can pity the Haydn aficionado who lived in New Orleans at the beginning of the nineteenth century. Despite public concerts commencing in 1805, the first mention of Haydn on a programme was not for another four years (Baron, 2013). As an example of a city with a bigger classical music culture, *Prague Concert Life, 1850–1881: An Annotated Database* (n.d.) allows a composer’s performance history in the city to be traced. There are dozens of performances of Handel’s compositions recorded during this period.
However, his English predecessors such as Henry Purcell, John Blow, Matthew Locke, and Jeremiah Clarke are not represented at all in this three decade time span.

Another perspective is to focus not on a city, but a composition. Bach’s *St. Matthew Passion* enjoyed a revival in the nineteenth century. However, according to Pardee (2009), the work was only performed in its entirety once in the nineteenth century, in 1873, in London. G. W. Cook (2001, p. 21) contradicts this, noting a complete performance in Boston in 1879, but in any case it is clear that such events were scarce. Mendelssohn’s famous performance of the work in 1829 omitted many of the 78 movements. Additionally, various instruments were replaced by contemporary alternatives (Clement, 2009). It is apparent that a music lover (especially one who enjoyed ensemble works) could not count on their preferred works being performed, hence the market for adaptations. Even if a live performance was accessible, adaptations were still useful. As Christensen (1999) notes, arrangements could help familiarise a listener with a work before a performance and remember it afterwards.

Adaptations can be educational tools in a multitude of ways. They can be beneficial for composers, for example, where Mozart adapted works by other composers as concertos before completing his own (Rushton, 2006). Adaptations can also facilitate students’ acquaintance with periods of music that predate their instrument. The average classical percussionist would have less understanding of Baroque music than the average violinist, given the percussion family’s very limited use at this time. The saxophone, as a nineteenth century invention, also suffers from this lack of original baroque compositions. Bogert (2013) notes that “I have been able to encourage my students’ interest in the work of important composers whose music predates the saxophone” (p. 1). Additionally compositions can be adapted to reduce their difficulty, therefore making them available to more musicians. Teaching books generally make frequent use of adaptations, as they allow students (and their parents) to appreciate a well-known composition at the beginning stages of learning.
Adaptations are commonly used in graded books such as those issued by the Australian Music Examinations Board, as well as in systems of teaching such as the Suzuki Method.

Summary

There are three main obstacles faced by the adaptation process. The first, lack of attention, has been addressed in a small way by the writing of this chapter. The second, a vast and confusing vocabulary, has been investigated and while no recommendations have been made regarding the wider use of adaptation-based terminology, a consistent approach has been employed throughout the writing. Finally, adaptations are frequently dismissed as far inferior to original compositions. By detailing some of the uses of adaptations (showing that in certain situations original compositions are less appropriate), it is hoped that adaptations are at least considered as valid musical works, rather than rejected outright. Suggestions regarding scope for further research are outlined in the final chapter of this document. Before approaching the topic question of this dissertation, that of how one adapts a prepared piano composition for solo multiple percussion, it is important to justify the existence of this category of adaptation and to understand the historical context of such an activity. This chapter has explained both the rationale and context of this research project.
Chapter 3: Dynamics

This chapter has a two-part structure. The first part provides a brief overview of dynamics and their history. Like the adaptation process, dynamic markings suffer from etymological ambiguity. In addition, abbreviations can sometimes prove confusing. Therefore, a recording of a piece may contain dynamics that do not correspond to what may be expected from reading the score. Such a detachment between the visual and aural experiences is the same as is encountered when reading and listening to a prepared piano work such as *Sonatas and Interludes*. The interpretation of dynamics is an integral part of the “process” part of the “source-process-output” paradigm, necessitating such an extensive historical overview. This section also explains that some instruments, such as the prepared piano and multiple percussion (the source and target instruments of this particular adaptation) do not use dynamics in a conventional way. Finally, the first part explains why dynamics have been less clearly notated than rhythm and pitch in Western Art Music. The second part demonstrates that the approach to dynamics of pianists (and prepared pianists) differs to that of percussionists, and therefore simply copying the dynamics from prepared piano to the percussion score is not adequate. Cage himself was aware of the dynamic tendencies of the prepared piano, in a short explanation at the beginning of the *Sonatas and Interludes* score he states that “mutes of various materials are placed between the strings of the keys used, thus effecting transformations of the piano sounds with respect to *all of their characteristics* [emphasis added]” (Cage, 1960, para. 1). The second part of the chapter concludes by demonstrating how I have attempted to use dynamic markings in order to produce an accurate, yet playable version of *Sonatas and Interludes*.

Dynamic markings are an integral part of music expression and are taught to students from the very beginning of their Western Art Music education. In standard pedagogical texts
used in formal training (such as through the Australian Music Examinations Board or public-
school education), whether specific-instrument or ensemble-band based, three of the basic
elements of music – pitch (where applicable), rhythm, and dynamics are introduced early in a
student’s education (Bastien, 1985, 1987; Lautzenheiser et al., 2004). It is easy, therefore, to
accept rudimentary definitions without question and to retain them without further
investigation into their meanings. Additionally, it is easy to assume that dynamic markings
and their interpretation have been consistent throughout the history of their usage. Having
surveyed relevant sources, including first edition scores and music dictionaries, it has become
apparent that the development of dynamic markings was a gradual process. When performing
a piece of music, it is vitally important to understand that the interpretation of dynamic
markings at the time and place of composition are contextual. That is, they may not
correspond directly to how we understand them today. Therefore it is important to
comprehend how the markings, symbols and abbreviations have been interpreted over time
and how these interpretations have changed up to the present day.

**Etymology**

Before exploring how the interpretations of dynamic markings have changed over
time, an investigation into the actual meanings of some of the terms is warranted. Like most
musical terms, the majority of the words pertaining to dynamics come from the Italian
language, but the word *dynamics* itself is English, dating back to the late eighteenth century
(Dynamics, n.d.). At this time, it was not a musical term, rather, it was used in science to
refer to forces. As will become apparent, the concepts of force and loudness appear together
quite frequently in music. The word *dynamics* entered the musical vocabulary in the mid-
nineteenth century, as demonstrated by Marshall and Stone’s following definition:

> Dynamics “is that department in the practice of music which consists in giving each
tone the stress which the subject requires, including the loud and the soft, the swell
and the diminish, the abrupt and the gentle, the staccato and the legato.” Musical
expression in general belongs to dynamics. (Marshall & Stone, 1852, p. 25)
This definition is quite broad, encompassing what would today be considered articulation as well as dynamics. These two areas were often considered together, in fact, some definitions of staccato include a volume component (Brown, 1999). The use of a single musical term to encompass dynamics and articulation will be discussed later in this chapter.

The two most basic terms regarding dynamics are forte and piano. These terms are Italian in origin and are interpreted as meaning loud and soft, respectively. Given the large proportion of Italian terms used in music, it has become clear the use of an Italian-English dictionary in order to check on an exact translation of terms would be beneficial to music students. Any change in linguistic usage over time could be compensated for by consulting a historical dictionary. My understanding of dynamics prior to conducting this research was that the markings and interpretations had been constant since they had first been developed. This misguided view would probably have remained for the rest of my career. However, the word forte actually means strong as well as loud. Piano means “flat, level, even” (Piano, 2010, p. 2202). The Italian word for quiet is tranquillo (Tranquillo, 2010). It is not usually relevant whether or not the musical definition corresponds with the literal Italian translation, as long as the performer understands the dynamic marking as the composer intended it. Additionally, for most instruments the force used to perform a note corresponds directly to the volume produced. This means that is irrelevant whether the forte marking means to play with strength or to produce a loud tone, it is one and the same. However, certain instruments such as the prepared piano and multiple percussion do not possess this direct relationship between force and volume. For these instruments it is vitally important to determine exactly what the composer intended.

**History of Dynamic Markings**

Although a few pieces in the sixteenth century featured dynamic markings, their use became more common in the early Baroque era. The use of dynamics throughout the
seventeenth century was not standard, with Thésée (Lully, 1688), composed in 1675, not including any markings. This does not mean that any of the music without dynamic markings was to be performed at a flat, unchanging volume level, any more than a piece with unspecified instrumentation must be played with all of the same instruments, or that a piece without tempo changes must be played robotically. As Gann (2000) states: “it was not incumbent upon Bach to put hairpins all over his score to tell the keyboardist what emotive expression he had in mind. A good musician can tell how to interpret that piece meaningfully and effectively” (para. 27). Rather, dynamic interpretation was left to the performers, one of whom was likely to be the composer. Any dynamic marking would have been intended for something vital to the integrity of the piece. Although few pieces included specific dynamics, some indication of the changing levels of volume can be interpreted by any change of the number of instruments playing simultaneously.

From the early eighteenth century dynamic markings became more common, however their meanings were often quite different to how they are interpreted today. Brown (1999) notes that indications of f and ff could be applied to single notes, much in the way that an accent or sforzando would be used today. If a composer wished to have a series of notes played loudly they could write f or ff above each one. As more words, symbols and abbreviations became available to the composer, absolute dynamic levels were considered continuous (until contradicted) rather than momentary. However, some composers from the nineteenth century onwards employed unnecessary duplicate dynamics, much in the same way as one would use a courtesy accidental. A famous example of such a marking is the second bar of Beethoven’s Eroica symphony. Cage also does this in Sonata V, where bar 37 is marked ff and bar 38 is marked pp. An additional ff marking is provided under the last note of bar 37. These unnecessary markings are used as if to say “yes, I really do want you to stay at this dynamic until I change it.”
By the middle of the eighteenth century, musicians were explaining the stylistic implications of dynamic markings. In 1752, Quantz (1985) notated hundreds of musical examples, showing their correct interpretation according to the prevailing style. He also stated that different grades of dissonance should have different dynamic levels. Leopold Mozart (1756/1985) put forward 34 musical examples where the first note in a slurred passage should be played louder than the subsequent notes and also suggested that notes suddenly changed by the use of accidentals should be played stronger than usual.

The eighteenth century also provided the first musical dictionaries, allowing musicians to see in a clear and concise form how various scholars viewed dynamics markings and words. Grassineau’s (1740) translation of Brossard’s 1703 dictionary lists *forte* and *fortement* as “strong and loud” (pp. 78 - 79), *forte forte* (or *f. f.*) and *più forte* as “a degree louder or stronger than Forte” (p. 79), and *fortissimo* (or *f. f. f.*) as “very loud or strong” (p. 79). The corresponding dynamics on the soft side: *piano, piano piano, più piano, and pianissimo* are listed, although there is no quiet equivalent to *fortement*. The term *echo* is listed as equivalent to *piano*. In 1772, Tans’ur presented *forte* as “loud and strong” (p. 198), *fortement* as “more loud than forte” (p. 198), and *fortissimo* as “as loud as possible” (p. 198) on the high end of the volume spectrum and *piano P.* as “soft and sweet, like an echo [sic]” (p. 207), *p.p.* as “more soft” (p. 206), and *p.p.p.* or *pianissimo* as “as soft and weak as possible” (p. 206) on the low end. Rousseau (1779) provided fewer, yet more detailed definitions. He lists *fortissimo* as used in Italian music, but not required in France as “they generally sing fortissimo without any direction” (p. 174). *Forte* is set in opposition to *dolce*, rather than *piano*. Rousseau is careful to differentiate *dolce* and *piano*, stating that *piano* is a purely volume-based direction, whereas *dolce* represents a sweeter style of playing. A medium level of volume is also explained, with *sotto voce, demi-voix, demi jeu, mezzo forte,* and *mezza voce* being presented as synonyms. In 1792, Callcott added *crescendo* and
*diminuendo* (but not *decrescendo*) and lists *forte*, *fortissimo*, *piano*, and *pianissimo* with abbreviations and definitions synonymous to those used today. However, *mezzo* is interpreted differently than to what today’s musician may understand. Used by itself, *mezzo* is defined as “to use the pedal of the grand piano forte, taking off only one string” (Callcott, 1792, p. 28), in the style of the *una corda* direction today. When employed before *forte* or *piano*, it is defined as “less than,” which places *mezzo piano* as similar to *pianissimo*, which is the opposite side of *piano* than is customary today. Whether *mezzo piano* or *pianissimo* is the quieter indication is not explained, nor is there any connection between the two listed. Perhaps this was a tentative early definition of *mezzo* – the term does not appear, either under its own heading or under those for *forte* or *piano* in Strahle’s (1994) *An Early Music Dictionary – Musical Terms From British Sources 1500 – 1740*. Busby (1823) provides a definition of *mezzo piano* that would be familiar to today’s musician.

It has already been shown that abbreviations have not always been equivalent to the term that would be expected today. Additionally, the use of them can potentially create confusion where the same abbreviation can stand for multiple terms. This must have been clear to the compilers of reference books who often provided multiple identical abbreviations. An example is Riemann (n.d.), who lists *pf* as both “poco forte (rather loud)” (p. 247) and “più forte (louder)” (p. 247). To confuse matters further, Hiles (1873) defines *pf* as “piano, then forte” (p. iv). It is clear that dynamics from this period of time must be very carefully scrutinised.

In the nineteenth century, a greater number of Italian directions were included in music notation. This was noted by Jousse (1829, p. vii), who wrote that “musical terms are already unnecessarily multiplied.” Scholars were not, however, in agreement as to how certain terms should be interpreted musically. The literal translation of *calando* is “decreasing,” which could refer to either the volume or tempo. Valentine (1833) and Stainer
and Barrett (1889) associate the direction with both aspects. Bottomley (1823) and Busby (1823) consider the term purely a tempo marking, whereas Danneley (1825) and Grove (1879) regard it as concerned only with volume, although the latter notes that the term is often encountered with a *ritardando*. Mathews (1884) uses “with decreasing force” (p. 10), which, although likely to be a volume indication, is a somewhat ambiguous definition.

As well as disagreeing on exact definitions, musicians were at odds as to which of the increasing list of definitions were equivalent. Callcott (1792), defines *calando* as “diminishing in point of time, for the sake of expression” (p. 27), but also refers the reader to this term in the entry for *perdendosi*, equating the two terms. Danneley (1825) associates both *calando* and *perdendosi* with similar musical parameters, as do Stainer and Barrett (1889). Valentine (1833) defines *perdendosi* as a volume direction only compared with *calando*, which also incorporates tempo. Adams (1851) associates *perdendosi* with tempo and volume without including an entry for *calando*, which was rectified ten years later (Adams, 1861), whereas Bottomley (1823) does not have an entry for *perdendosi*. Grove (1880) is more precise, equating *perdendosi* with volume only, but adds that “in the later modern masters, a slight rallentando [is incorporated] as well” (p. 685). It is outside the scope of this study to equate precise definitions with specific composers or works.

The nineteenth century was characterised by the use of extremes – of register, ensemble size, and of dynamic range. Orchestras became larger, while the piano gained an iron frame, making louder volumes possible. Markings for “as loud as possible” and “as soft as possible” had existed since the 1700s, however composers were more likely to use extreme dynamic markings such as *pppp* and *ffff* to express this.

By the turn of the twentieth century, there was very little to add to the notation of traditional dynamic markings. *Mode de Valeurs et d'Intensités* (Messiaen, 1950) preceded integral serialism by assigning a specific dynamic to each pitch. Despite the fact that
dynamics were treated in a new way, the notation was traditional and could have been understood by a nineteenth century musician. However, the advent of graphic notation allowed composers to notationally represent the idea of dynamics in a completely different way. In Stockhausen’s Zyklus (1960), lines as well as note heads represent the music, with the thickness of the line or dot being used to convey the dynamic information. Cage’s 27’10.554”: For a Percussionist (Cage, 1960) assigns the vertical position of the note head to volume, rather than pitch. A reference line of mezzo forte is given, with notes higher than the line to be louder, with those below the line to be quieter. Azione a Due by Boguslaw Schäffer equates volume with the amount of the note head that is filled in (Read, 1987). A pianississimo note is empty like a minim, with each increasing dynamic level filling in an eighth of the notehead, until fortississimo is totally black, like a crotchet.

Other Notational Developments

The development of notation for dynamics has not been one of continual progression. Some ideas, such as the box (either a form of tenuto or accent), have not been adopted universally. Others have been part of alternate notational systems. Gardner Read’s Source Book of Proposed Music Notation Reforms (1987) includes many interesting variations including one by Joseph Warren which notates dynamics through the use of different sized note heads. Chromographische Darstellung der Tondichtungen by Adolph Decher presents notes as rectangular boxes, with different shadings representing the dynamic levels.

While Read’s book is interesting in presenting various notational systems, its true value in this research lies in showing the limited amount of experimentation that has occurred in the field of dynamic notation. Klavarskribo, for example, with its vertical staff and unusual note head shading, utilises conventional dynamic markings. Sistema General de Escritura Musical and Vereinfachung und Erleichtering de musikalischen Notenschreibung are two of the many notational systems that use numbers to represent pitch, yet neither of these present
new dynamic indications. Out of the 391 new notational approaches compiled by Read, only ten (2.56%) include a novel means of expressing dynamics.

**Instruments With Unusual Dynamic Characteristics**

Certain instruments have had particular characteristics pertaining to their dynamic abilities. Unlike other keyboard instruments, the harpsichord and organ are unable to use varying forces upon the keys in order to effect dynamic changes. A level of dynamic variety has been enabled on the harpsichord through the use of multiple keyboards. Additionally, the use of effects such as doubling and arpeggiation has been described by Quantz (1985) in order to simulate changes in dynamics. The organ has been able to use various combinations of stops to change the volume and timbre, as well as the use of multiple manuals in the style of the harpsichord. However, the development of the swell pedal in the late seventeenth century allowed gradual dynamic changes whilst using both of the hands on the manuals. This invention allowed the volume of an entire manual to be adjusted, regardless of the number of notes being played, but did not allow for individual note dynamics in the way that a piano does.

The natural horn is the ancestor of the valved French horn, a nineteenth century development. This instrument does not have any valves and therefore can only produce overtones of a fundamental pitch. Unlike similar brass instruments lacking pistons and valves, such as the bugle, the natural horn player can place a hand in the bell in order to change the pitch, thus filling in the gaps between the notes. The use of the hand not only changes the pitch of the note but also its volume and timbre. In some cases the horn player was required to even out the volume in a passage by changing the amount of breath force imparted on the instrument, whereas sometimes the unevenness of volume and tone was used for effect (Tatum, 2011). There are certain unambiguous examples cited where a composer has employed notes requiring the hand to be used to change the volume of a section of music.
without changing the dynamic marking, implying that at least some of the time the dynamic indication was that of force, rather than volume (Silberman, 2008).

**A Dynamic Scale**

The lack of objective amplitude grading for dynamics can be partially explained by the fact that volume has been poorly understood in comparison to rhythm and pitch. The mathematical principles of pitch have been understood since the 6th century B.C., with Pythagorean temperament having been adapted to suit certain keys since the fifteenth century. Rhythm is simple to calculate mathematically. Whilst the metronome was not invented until the early nineteenth century, the mensural notation of rhythm has been fairly consistent from 200 years previously. Volume, on the other hand, is different. The science behind the perception of volume is more complicated, with its logarithmic properties meaning that to double the listener’s impression of volume, ten times as much power is required. Timbre is similarly complicated, which explains why a comparative discussion of this property was not fully investigated until the advent of electronic instruments.

Volume is also the most difficult parameter to control in the transmission of music. In a concert hall or open air amphitheatre, the perception of rhythms, pitches and timbres of the music may be slightly altered from person to person, but it is the volume that changes the most. Additionally, a home stereo system does not have pitch, timbre or rhythm controls, but volume control is ubiquitous. The graphic equalizer or tone control knob is merely a way to control the relative volumes of the various frequencies.

**Dynamic Characteristics: Prepared Piano and Multiple Percussion**

The dynamic characteristics of the prepared piano and multiple percussion are unusual in comparison with conventional pitch-based instruments. The etymological investigation in the previous section is necessary to provide historical context to the research conducted in regard to the interpretation of dynamics in a timbre-based adaptation.
In 2004, when I started adapting *Sonatas and Interludes* for solo multiple percussion, I was completely oblivious to the complexities involved in the interpretation of dynamics. I was not aware of the literal meanings of the elementary Italian terms, nor of the inconsistent definitions during the nineteenth century. Most importantly, I had very limited knowledge of instruments with unusual dynamic characteristics – the exception being my own instrument, multiple percussion.

When I completed my first adaptations, I was focussed primarily on the translation of the prepared piano timbres into sounds that could be created by percussion instruments. I did not think that the notation of dynamics would be a complex task. One of my first adaptations included dynamics, but this was purely to differentiate between the melody and the accompaniment. After completing two adaptations, I decided to omit dynamics completely, the plan being to notate them all at the end, copying what was on the prepared piano score.

I have come to realise that the interpretation of dynamics is far more complex than this, for the reasons that will be detailed later in this chapter. However, in retrospect, I find it difficult to explain why this realisation took so long. Cage himself was aware of the dynamic implications of preparing the piano, as he states as much in the introduction to *Sonatas and Interludes*, a text that I had read numerous times over many years.

If there is any consolation in this prolonged ignorance, it is that the dynamic characteristics are regularly neglected in comparison to timbre and pitch. Timbre is always discussed due to the preparation of the piano causing such an obvious modification. Pitch alteration is also commonly considered, although not as comprehensively. The use of the term *mute* is quite common (following Cage’s use of the word), however, the relative muting capabilities of various materials on the piano string is rarely considered. Finally, discussion of the duration of a prepared piano note is absent from nearly all sources.
An example of the lack of care given to the varying dynamics of prepared piano notes can be found in David Revill’s biography of Cage (1992), which states: “The instrument possessed the dynamic range of the harpsichord. Rather than producing a scalar succession of pitches, different registers of the keyboard yielded varied timbres” (p. 70). Considering that Revill was already discussing dynamics in the first sentence, the second was a missed opportunity to discuss “varied dynamic responses.”

I was familiar with the table of preparations and the multitude of different objects required to be placed between the strings. However, when I went back and listened to the movements, what I heard was surprising. Instead of the volumes of the individual notes being consistent and corresponding with the dynamic marking in the score, the sounds were haphazard in certain places, almost random. I had never before encountered music where this was the case.

This shocked me. I had spent a lot of time demonstrating how multiple percussion and prepared piano are similar instruments and I expected their interpretation of dynamics to be the same. The following examples demonstrate the differences in interpretation of dynamics and resulting amplitude of sound between the violin (an example of a conventional pitch-based instrument), prepared piano and multiple percussion, using a hypothetical example. The clef is omitted, allowing the example to apply to any instrument.

![Figure 5. Simple Dynamic Changes Over a Limited Score Range](image)

Imagine, for example, that this score is for violin playing up from A to D (imagining a treble clef). Over a limited pitch range, the amount of bow force required to play these notes
would be consistent for the mezzo-piano section and then increase immediately for the forte section, staying constant for the next four notes. Comparative diagrams for force and volume would look similar to Figure 6.

Figure 6. Force vs. Volume: Conventional Pitch-Based Instrument

Multiple percussion is very different. Different instruments “speak” at different volumes and so the percussionist must compensate for these in order to create a dynamically smooth line between instruments. This compensation, by the way, is not limited to percussionists playing multiple instruments by themselves. Band and orchestral percussionists learn very early that it is easier to create a loud sound out of a pair of crash cymbals than a triangle and therefore they must provide differing levels of force to create equal dynamics. Imagining a percussion clef in front of Figure 5 could result in a force versus volume diagram such as Figure 7.
For both the conventional pitch-based instrument and multiple percussion, the notated dynamic marking is equivalent to the audible volume. The prepared piano is different, due to reasons explained later in this chapter. Instead of the dynamic marking being equal to volume, it is equal to force, resulting in fluctuating volumes within a notated dynamic, as shown in Figure 8.

**Figure 7. Force vs. Volume: Percussion**

**Figure 8. Force vs. Volume: Prepared Piano**
Similarly, varying dynamic markings may create the same volume. Hudicek (2002, p. 167), referring to the prepared piano, notes that “playing with a forte touch as compared to a piano touch will produce a different sound, but it may not produce a different dynamic level.”

The main task in adapting prepared piano music for multiple percussion with respect to dynamics is to identify these different attitudes. I had wondered why this discrepancy occurs, which has led to the development of a personal theory. Percussionists deal with multiple instruments and their differing dynamic responses from the very beginning of their education, whether it is with crash cymbals, bass drum, snare drum, and triangle in band or with the multitude of instruments that comprise the modern drumset. Part of a percussionist’s education is acquiring the ability to even out the sounds of these vastly different instruments in order to create a coherent musical line. Pianists, on the other hand, consciously train their fingers to create a consistent downward pressure on the keys, compensating for different finger weights and strengths. When they move to the prepared piano, these ingrained performing techniques remain.

It appears that Jean-François Proulx agrees with prepared piano dynamics being interpreted as indications of force rather than of volume. In his dissertation *A Pedagogical Guide to Extended Piano Techniques*, Proulx argues that “prepared piano techniques are excluded because they do not require the acquisition of performance skills” (Proulx, 2009, p. iv). Ishii (2005, p. 18) agrees that “pianists are not required to have innovative technical skills.” If dynamics were interpreted as indications of volume, the pianist would be required to change the force exerted on each note in order to create a consistent volume. This would necessitate the acquisition of performance skills.

**Effect on the Adaptation**

Cage’s compositional method for *Sonatas and Interludes* was based on his improvisation at the prepared piano. As a result, arpeggios and scales are abundant. In these
running lines, certain notes either sound more prominent than those surrounding, or fade away into the background, creating a type of hole in the line. Where these are considered important, I have notated the louder notes with an accent and the quieter ones as ghost notes. Ghost notes are commonly used in drumset music and are indicated by surrounding the note with parentheses.

The approach to dynamics within a chord is more complicated for two reasons. Firstly, a multiple percussion chord can be created not just from a prepared piano chord, but also from a single prepared piano note. This is an example of where it is very important to base the adaptation on the sound of the recording, rather than concentrating too much on the score. Secondly, the notation of accents within a chord is difficult. Luckily, this fact escaped my attention until I was reviewing my use of accents and ghost notes at the end of the adaptation process. As ghost notes are indicated using parentheses, they are more easily applied to single notes within a chord.

Following on from Cage’s percussion works, ostinati are another characteristic of *Sonatas and Interludes*. In some cases, a particular note in the ostinato features more or less prominently, with the corresponding note in the percussion score featuring accents or ghost notes throughout the ostinato.

**Summary**

In this chapter I have explored the complex history of dynamic indications, noting the ambiguity of certain markings. This helped form a historical context to my own approach to dynamics in adapting *Sonatas and Interludes*. I have also compared the approaches to these markings from a pianist’s and percussionist’s perspective, in comparison to those of a conventional pitch-based instrumentalist’s. Finally, I have demonstrated how I have interpreted the dynamic markings in the production of the appended multiple percussion score.
Chapter 4: Phrase Contour

In addition to volume, another area of concern introduced in the adaptation process is the interpretation of pitch. Most prepared piano notes have at least one distinguishable pitch, and yet the correct way to approach the pitch component of a prepared piano note is not always apparent. The interpretation of prepared piano notes, whether played individually or in a phrase, will be investigated from two different perspectives. The first provides a historical background to the relationship between a note’s vertical placement on the staff and its sounding pitch dating back a millennium to the development of the staff. This background demonstrates that the prepared piano and multiple percussion are two instruments that abandon the “higher on the staff is a higher sounding pitch” mentality. The second part demonstrates how I have attempted to translate the contour of prepared piano phrases to multiple percussion.

**Background to Pitch-Location Relationship**

The relationship between a note’s location on the staff and its precise pitch has always been a tenuous one. Since Guido d’Arezzo’s eleventh century invention of the staff, various modifications have complicated this relationship. Such modifications include the use of different clefs (including those with octave alterations, such as the suboctave treble clef), non-clef octave alterations (such as the ottava sign), and the advent of transposing instruments. However, given that the previous modifications are constant throughout a section of music, it is fairly safe to assume that the relationship between relative note position and relative pitch is clear – higher sounding notes are located higher on the staff.

The correlation between height and pitch is common, although not ubiquitous, amongst the world’s cultures. In Western Art Music, this correlation is also used in other notation systems. Neumes indicating relative pitch, where higher pitches are placed higher on
the page, predate the invention of the staff. Helmholtz Pitch Notation uses dashes above or below a pitch class to indicate octave. Even alternate notation systems, as collated by Gardner Read (1987), commonly associate pitch with vertical position.

**Relationship With Regard to Multiple Percussion**

In the case of multiple percussion and the prepared piano, the relationship between a note’s position on the staff and its pitch is not so clear. Exact pitch is not an important factor in the construction of most percussion instruments. It is also historically of limited importance to composers, who sometimes use vague terms such as “high” and “low” to differentiate between instruments of the same type. Therefore the notation of percussion instruments together on a staff cannot provide an exact correlation between staff position and sounding pitch unless precise pitches are specified, either by inclusion of a pitch clef (such as the treble or bass clefs) or in the instrument listing, which is rare. This is further complicated by the fact that it is general practice to group similar instruments together within a staff, which may maintain a pitch hierarchy between such instruments at the expense of an overall pitch hierarchy.

**Relationship With Regard to Prepared Piano**

The prepared piano disregards the conventional relationship between pitch and note position for a different reason. Unlike the multiple percussion composer, the writer for prepared piano does not choose the staff location of particular sounds, as they are produced using the keys of a piano, which uses the grand staff. Whereas a multiple percussion score will generally include a notational key in order to show the performer the location of instruments on the staff, the prepared piano player requires no such information. Instead of a notational key, a table of preparations is usually provided in order to instruct the performer as to the alterations to a range of the piano notes: “Mutes of various materials are placed between the strings of the keys used, thus effecting transformations of the piano sounds with
respect to all of their characteristics” (Cage, 1960l, para. 1). One of these characteristics is pitch. In my experience, higher notes on the piano are more likely to produce high sounding prepared notes, whereas low notes on the piano tend to produce low sounding prepared notes. However, within a limited written range of pitches there is no guarantee that higher notes on the staff result in higher sounding pitches, due to the wide variety of preparations possible. Additionally, a single prepared note can have more than one distinct pitch, creating the sound of a chord, the treatment of which is discussed in Chapter 3.

Given that the pitch-location relationship is complicated for both multiple percussion and prepared piano, I have attempted many differing interpretations of the pitch aspect of the adaptation. A single example is presented as Figure 9 in order to show the various methods used to attempt to reach a viable solution. This example is taken from Sonata XIV, bars 21-22.

![Figure 9. Sonata XIV, Bars 21-22 (As Notated With Annotations)](image)

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**Evolution of Methodologies**

**Method 1: Matching Notated Pitch With Sounding Pitch**

An adaptation method equating relative staff position with pitch was the first attempt at correlating the prepared piano and multiple percussion scores. I had assumed that notes higher on the staff would result in higher pitched prepared piano sounds. Figure 9 shows the
notes as they are presented in the prepared piano score. As the B-Flat and D at the beginning of bar 21 are unprepared notes, they sound as written. The notes in the box are prepared and are shown in Figures 10 and 11 in graph form.

![Graph](image)

*Figure 10. Sonata XIV, Bars 21-22 (As Notated, Graphical Representation)*

As the aim of this method was to correlate notated pitch with the resulting sound, Figure 11 shows the sounding pitches of the percussion instruments for this example. The trajectory of the pitches is downwards, the same as the notated pitch in Figure 10. No consideration was given to the intervals between the written pitches.
This method was only used for a short time due to the discovery of the almost arbitrary relationship between the notated prepared piano pitch and its resulting sound. Rather than being a downward contour without exception (as the score was), the pitches of the recording moved around haphazardly (as demonstrated in Figure 12).

**Method 2: Matching Pitch Contour Precisely**

The precise matching of the pitch contour of the recording by percussion instruments rejected the arbitrary nature of the previous method and replaced it with something much more precise. Rather than basing the resulting pitch contour on that of the written prepared piano score, it was based on the relative pitch relationships of all notes used in one particular recording of the movement. This often involved using computer software to slow down the audio. Figure 12 shows the sounding pitches of the same example, presented graphically, in comparison with the notated pitch. Note that the following graph is applicable only to one recording (as is discussed later in this chapter).
Figure 12. Audio Contour, Sonata XIV, Bars 21-22 (Prepared Piano Recording)

I had already determined which instruments I thought the prepared piano notes sounded like. The next step was to order the instruments by pitch, which is shown in Table 1.

Table 1
Sonata XIV, Bars 21-22 (Ranked by Sounding Pitch)

<table>
<thead>
<tr>
<th>Note</th>
<th>Notated Pitch</th>
<th>Instrument</th>
<th>Pitch Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ab</td>
<td>Metal</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
</tr>
<tr>
<td>2</td>
<td>Gb</td>
<td>Metal</td>
<td>6&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>Metal</td>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>Metal</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
<td>Metal</td>
<td>7&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>6</td>
<td>G</td>
<td>Temple Block</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
</tr>
<tr>
<td>7</td>
<td>D</td>
<td>Temple Block</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
</tr>
<tr>
<td>8</td>
<td>Bb</td>
<td>Drum</td>
<td>8&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>9</td>
<td>Ab</td>
<td>Drum</td>
<td>9&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

This method was abandoned for a few reasons. Firstly, the analysis of the sounding pitches began to feel like a science experiment rather than an artistic endeavour. Secondly, it was extremely time intensive, which is probably why I used it only on the movements where
very few distinct pitches were used. Finally, I realised that it was going to be very difficult for a performer to procure instruments with exactly the same pitch relationships as those that I had used. At the beginning of the adaptation process I had no intention of completing the entire set of movements. Additionally, I had no intention of having anyone else play the existing movements. In regard to wider performance, this method was horribly inflexible and needed to go. This prompted the question as to what should replace it.

**Method 3A: Approximating Contour and Adding Tonality**

Earlier in this chapter I stated that the prepared piano broke with the convention of higher notes on the staff necessarily resulting in higher sounding pitches. However, the fact that a piano is prepared does not mean that alterations have been applied to all of the piano’s notes. In *Sonatas and Interludes*, only 45 of the piano’s 88 notes are prepared, leaving the others to sound at the pitch they are written.

Until 2010, I only divided the prepared piano notes into two categories. Unprepared notes were scored for vibraphone and glockenspiel, whereas prepared notes were scored for drums, blocks, and other untuned instruments. This approach changed when I read Jeffrey Perry’s *Cage’s Sonatas and Interludes for Prepared Piano: Performance, Hearing and Analysis* (Perry, 2005). Perry’s analysis of *Sonatas and Interludes* with respect to specific pitches and tonalities is mainly limited to the notes on the piano that are unprepared, or prepared in such a way that the unprepared pitch remains. This approach is completely understandable, considering that Perry’s analysis is based on the score, rather than a particular recording. As an example, consider the last two notes of Figure 13. These two notes are written as the B-Flat and A-Flat below Middle C, with both pedals depressed.
Figure 13. Sonata XIV, Bars 21-22 (As Notated)

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Figure 14 shows the sounding pitches of ten different versions of Sonatas and Interludes, recorded by Berman (Cage, 1960j/1999, track 18), Vandré (Cage, 1960m/1996, track 9), K. Boyd (Cage, 1960e/2014, track 18), Anissegos (Cage, 1960c/2014, track 18), J. Pierce (Cage, 1960k/1989, track 18), Karis (Cage, 1960d/n.d., track 18), Steinberg (Cage, 1960i/2004, track 18), Dupuy (Cage, 1960g/2007, track 18), Körmendi (Cage, 1960h/1984, track 7), and MacGregor (Cage, 1960f/2011, track 18). The first bar represents the sounding pitches for the first note (notated as B-Flat on the prepared piano score) with the second bar representing the second note (notated as A-Flat).

Figure 14. Sonata XIV, Bar 22, First Two Notes, Sounding Pitches (Aggregated)
Two things are clear from this example. Firstly, in all ten recordings both notes sound at a lower pitch than they are written and secondly, as there are only five distinct sounding pitches for each note, some recordings share sounding pitches (at least within the range of a semitone).

Analysing the notes individually may infer some level of homogeneity between the recordings. However, when multiple notes are analysed in succession this illusion is broken. Figure 15 shows the sounding pitches for each of the ten recordings individually. This demonstrates a much greater disparity, not only of pitch but of interval and even direction. In seven out of the ten recordings the first note is the higher sounding. The size of the interval ranges from a semitone to a tritone, with the most common being a semitone, which occurs five times. This complete lack of any homogeneity precludes incorporation of prepared notes into any discussion of tonality in the composition.

![Figure 15. Sonata XIV, Bar 22, First Two Notes, Sounding Pitches (Individual Recordings)](image)

The benefit of basing my adaptation on one recording is that I am not obliged to consider the characteristics of any other recordings. This allows me to incorporate prepared notes into an overall tonality, integrating this into my adaptation by using tuned drums (roto toms) as well as simultaneous use of tuned and untuned percussion. When listening to the Frémy recording of Sonata XIV, I noticed that the unprepared B-Flat and D at the beginning of bar 21 matched with the F and B-Flat drum-like sounds at the beginning of bar 22 in order to create a B-Flat Major tonality, as is shown in Figure 16.

---

11 Another notable example is the use of roto toms in B and E to emphasise the E minor tonality of Sonata XI, bar 7.
At about the same time as I was considering the use of tonality in my adaptation, I was also attempting to bring about a compromise between the arbitrary nature of Method 1 and the overly strict Method 2. I decided that I could approximate the contour by listening to the prepared piano recording and describing this contour in a few words. Table 2 shows the comparison between the thought processes of the methods.

Table 2

<table>
<thead>
<tr>
<th>Precision</th>
<th>Thought Process</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vague</td>
<td>“The notes trend down in pitch, matching the visual appearance”</td>
<td>1</td>
</tr>
<tr>
<td>Moderate</td>
<td>“The notes trend generally down in pitch with a few exceptions”</td>
<td>3A</td>
</tr>
<tr>
<td>Precise</td>
<td>“The notes must match the exact audio contour”</td>
<td>2</td>
</tr>
</tbody>
</table>

**Method 3B: Matching Contour Within Instrument Groupings**

This method was employed as a refinement of Method 3A. The thought process was still to follow the approximate contour of the prepared piano recording. However, within instrument groupings (metal plates, blocks, tom toms, for example) the prepared piano tones would be ordered from high to low for a particular phrase. Figure 17 shows the sounding
pitch of the prepared piano recording, with the individual notes collated into their instrumental groupings.

![Diagram](image)

*Figure 17. Sonata XIV, Bars 21-22, Audio Contour, Showing Groups of Instruments*

It is clear from this that the first metal in the example should be the highest of the five played, with the second-lowest, middle, second-highest, and lowest of the five following. Similarly, of the two temple blocks employed in this example, the lower should be played two notes before the higher. This is summarised in Table 3, where “pitch order” refers to each instrument’s grouping.
Table 3

Sonata XIV, Bars 21-22, Instruments and Relative Pitches in Groupings

<table>
<thead>
<tr>
<th>Note</th>
<th>Notated Pitch</th>
<th>Instrument</th>
<th>Pitch Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ab</td>
<td>Metal</td>
<td>1\textsuperscript{st}</td>
</tr>
<tr>
<td>2</td>
<td>Gb</td>
<td>Metal</td>
<td>3\textsuperscript{rd}</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>Metal</td>
<td>4\textsuperscript{th}</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>Metal</td>
<td>2\textsuperscript{nd}</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
<td>Metal</td>
<td>5\textsuperscript{th}</td>
</tr>
<tr>
<td>6</td>
<td>G</td>
<td>Temple Block</td>
<td>1\textsuperscript{st}</td>
</tr>
<tr>
<td>7</td>
<td>D</td>
<td>Temple Block</td>
<td>2\textsuperscript{nd}</td>
</tr>
<tr>
<td>8</td>
<td>Bb</td>
<td>Drum</td>
<td>1\textsuperscript{st}</td>
</tr>
<tr>
<td>9</td>
<td>Ab</td>
<td>Drum</td>
<td>2\textsuperscript{nd}</td>
</tr>
</tbody>
</table>

Method 3C: Adding Instrumental Flexibility Within Groupings

This modification exists only due to the fact that the adaptation contains multiple movements. The whole of the adaptation requires five metal plates, three woodblocks, four temple blocks, five tom toms, and three gongs (as well as an assortment of singular instruments). However, each movement only requires a subset of this overall instrumentation. I had originally been quite specific in the score as to which instruments I wanted for each movement. For example, one of the movements was scored for (among others) two tom toms, which I had designated as the second and fourth-highest of the five.

In the middle of 2016, I began to question whether this level of specificity was as important as I had previously thought. I decided that the choice of instruments was a decision that was better left in a competent performer’s hands than in mine. Instead of specifying exact instruments, I instead scored each set of instruments using the highest possible staff position for that particular instrument. In the example previously cited, instead of writing for the second and fourth-highest tom toms, I wrote for the highest two tom toms. In the preface to the score, it is made clear that the performer may choose any two out of the five tom toms, as
long as the pitch relationship stays the same – that is, the instrument assigned the highest tom tom position on the staff is pitched higher than the instrument assigned the second-highest tom tom position. The performer is free to change the subset of instruments used at the change of movement, with the exception of Sonata XIV and Sonata XV, which must use the same subset. The sleighbells are not interchangeable due to their being a different instrument type. Temple blocks may not be exchanged with wood blocks and the chamber bass drum is not interchangeable with the tom toms.

Summary

The correlation between pitch and vertical staff position may be clear in Western Art Music, however, for the prepared piano and multiple percussion this connection is more ambiguous. This ambiguity has led to several varied approaches to the interpretation of the pitch aspect of the original composition, which have been laid out in chronological order.

The interpretation of pitch contour has been a balancing act. If this interpretation was too strict, it would be impossibly difficult for performers to source a set of instruments that would fulfil all of the pitch requirements. On the other hand, if the interpretation was too liberal, many of the interesting tonal characteristics of Sonatas and Interludes would be lost.

One of my teachers, himself a composer, once mentioned to me that he thought that Cage’s use of tonality would be what set him apart from other twentieth century composers in the minds of future musicians. While I am unsure as to whether I agree with this sentiment, Cage’s use of tonality in Sonatas and Interludes certainly made the adaptation process a lot more interesting.
Chapter 5: Specific Notation Requirements

In the introduction to this dissertation I discussed the “source-process-output” paradigm. The previous two chapters discussed the process of adaptation, through the interpretation of the volume and pitch components of the music. This chapter concerns the output (the multiple percussion score) and again has a bipartite structure. The first, introductory, section provides a background to multiple percussion notation and the second details specific decisions made during my adaptation of Sonatas and Interludes.

Notation Approaches: Prepared Piano and Multiple Percussion

Previous chapters have noted the similarity between multiple percussion and prepared piano with respect to their dynamic and pitch characteristics. Focussing on notation, there are some clear differences, which are connected with the physical presence of the two instruments. The prepared piano is an alteration of an instrument with a long established notation system. The alterations are to the strings of the piano and the performance technique and notation are generally the same as the unprepared piano. Any competent pianist presented with a correctly prepared piano could perform Sonatas and Interludes. Multiple percussion, on the other hand, is not an alteration of an instrument with a set notational system. Rather, it is an accumulation of existing instruments. The notation of multiple percussion music is not like that of any other instrument. As multiple percussion setups can include an infinite variety of instruments, there is no single way of notating all multiple percussion pieces successfully. Indeed, there are often many ways with which a particular work could be notated.

Composers and adapters do not always notate multiple percussion (or percussion in general) in the most efficient or logical manner. Some percussionists have attempted to rewrite percussion parts in order to make them easier for percussionists, without changing the music. An example of this is Stravinsky’s Histoire du Soldat (1918), which has percussion
One multiple percussion notation system that is comparable to the prepared piano is timbre staff notation. In this system the percussion instruments are arranged in a keyboard formation. Two rows of instruments correspond to the naturals and accidentals of the keyboard. The similarity is that while both the prepared piano and timbre staff imply specific pitches in their notation, there is no connection with the actual pitch produced by the instrument. The similarity between these instruments has been noted by Julian-Jones (2005, p. 43). Unfortunately, timbre staff notation and instrument layout does not suit my adaptation, due to the number of instruments employed. If I were to employ a timbre staff instrumental layout, the physical distance between instruments would be too large to be efficient.

The writings on notation systems for multiple percussion range from the general, discussing the wide range of notation systems to the specific, such as the efficacy of various notation systems with respect to sight reading. These are valuable in demonstrating the relative merits of the notation systems in particular circumstances. Additionally, my own previous experience as a percussion student specialising in solo multiple percussion has helped inform my views in this area. Whilst reading through the literature has been interesting and enlightening, there have been several issues in the adaptation of Sonatas and Interludes that have required a great deal of thought and consideration regarding the layout of the score.

**Notation During the Adaptation Process**

The range of instruments used in my adaptation of Sonatas and Interludes is necessarily vast, with the visual distribution of them onto a score being a lengthy and, at times, confusing project. Thirty-two instruments are employed throughout twenty movements.

---

12 Exactly what constitutes a large multiple percussion setup is not certain, but Kamstra (2006, p. iii) states that thirteen instruments is a large setup.
Some of these movements use nearly all of the instruments, a few use between ten and fifteen, and one of them only uses seven.

**Overall Approach**

I believe that in a unified work such as *Sonatas and Interludes* it is important to maintain a consistent style of notation that can be applied to the entire work. However, when I first arranged *Sonata V* in 2004, it was designed as a stand-alone piece, with no consideration given to any aspect of the other movements. As such, the notation style was designed to fit this one movement and the instrumentation that it employed, as shown in Figure 18. Note that annotations have been added to show instrumentation, which was originally displayed on a separate notational key.

![Figure 18. Sonata V (2004 Version), Bars 1-4](image)

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As subsequent movements were completed, I realised that the sequential nature of my adapting style would be problematic. I did not know which instruments would be required in
subsequent movements and therefore had no indication as to what notational choices would have to be made. I had three choices as to the overall layout of *Sonatas and Interludes*:

- Adapt each movement as a stand-alone piece, each with its own notational key and staff order.
- Decide on a global set of parameters at the beginning of the project and persist with it.
- Consider the notation aspects of the work after the music is determined.

The first option was dismissed almost immediately due to its incompatibility with the holistic nature of the work that I was trying to promote. Choosing between the other two options was more difficult. However, I decided to choose the latter, leaving the notational issues until after the notes themselves were completed. At the point that this decision was made, I was fully aware that my knowledge of *Sonatas and Interludes*, not to mention multiple percussion music in general, was very limited and I believed that if I made large-scale decisions regarding the layout of the work they would likely be altered when new information was acquired. If I was going to be rewriting the work anyway it made sense to make the first draft as easy to adapt as possible, treating each individual movement as a stand-alone piece. I was very aware that I did not want the music to be dictated to by any notational constraints and believed that working out the music first and leaving the details of notation to the end was the best way of achieving this aim.

**Grouping of Instruments**

It would be wrong to say that I was closing my mind off to any ideas regarding the overall notation. Rather, at this point in time (towards the end of 2005), I was aware of some of the large scale features that the score would incorporate. My adapting and listening style had broken the instrumentation into some large scale groups: tuned metallophones, drums, gongs, and assorted other percussion. To order the notation around these groupings appeared to be a sensible approach. Without thinking about it, I tended (after a few movements where I
was still grasping with the notation) to give an instrument (or group of instruments) its own staff where it played a musical line - melody or accompaniment - by itself. For most of the movements this meant that the keyboard instruments each received their own line as did the group of tom toms. I briefly considered using only one staff for the keyboard instruments, however a few issues made this impractical. For example, the overlapping ranges of the instruments\textsuperscript{13} allowed me to use this shared pitch area for colouristic purposes, which made differentiating between the two quite difficult. The tom tom staff was later altered to include other drums that were used in later movements such as roto toms and the bass drum. As the gongs were only used in special circumstances, these were assigned their own staff.

The “assorted other” percussion was the last staff issue to be determined. I had grouped these instruments together when I was adapting individual movements, as a small subset of these was employed for each movement. However, with about 75\% of the movements completed, I realised that I was going to have more instruments than I could comfortably fit on a five line staff. Employing all five lines and six spaces can only accommodate eleven instruments. The following options were considered:

- Employ ledger lines
- Include a percussion staff with more than five lines
- Use different notational techniques (e.g. different noteheads or colours)
- Split the staff into two separate staves

The first option was dismissed almost immediately as in my mind ledger lines imply less frequently used notes. The second option could possibly have been viable had the number of “assorted other” instruments been a few more than eleven, but at eighteen the number of lines required is nine, which appeared to be too many to be grouped together. The

\textsuperscript{13} Considering the standard ranges of the vibraphone (F3 – F6, given that Middle C is C4) and glockenspiel (G5 – C8), there is an overlap of a minor 7\textsuperscript{th}. The overlap in my adaptation (which uses tone bars or an extended range glockenspiel), is a perfect 11\textsuperscript{th}.
use of different styles of note heads, or even different colours for different instruments was 
considered, but this tended to complicate the look of the score, especially if the same line or 
space was required for two different instruments simultaneously. I therefore decided to take 
the fourth option, splitting the percussion staff into two staves. This option was not without 
its own downsides, however. The issue of cross-staff beaming is considered later in this 
chapter. In polyphonic music, such as certain sections of *Sonatas and Interludes*, the addition 
of extra staves complicates the look of the music, as sometimes the beaming is required to 
jump from one staff to another that is not adjacent. However, it was decided that this option 
provided the fewest compromises as to the clarity of notation. Therefore the instrumentation 
was divided into blocks (temple and wood) and “other percussion.”

**Staff Order and Cross-Staff Beaming**

Having settled on using six separate staves, an order had to be determined. The two 
main areas of consideration were the impact of staff order on cross-staff beaming (and 
subsequent score neatness) and relationships between instrument setup, score order and pitch.

A characteristic of *Sonatas and Interludes* is the use of scales and arpeggios in tandem 
with varying note preparations in order to create a musical line that jumps across differing 
timbres. In the prepared piano score it is generally very simple to see where the melodic lines 
lie, however, with a multiple percussion score this can be much more difficult, especially 
when the line may be spread across up to six staves. This is achieved through cross-staff 
beaming, where note heads on different staves are connected by a common beam or beams 
(depending on the note value). When I first adapted *Sonatas and Interludes* I did not employ 
beams at all, whereas the current version employs cross-staff beaming which makes the 
melodic line clear, as shown in Figure 19.
Cross-staff beaming generally looks neatest when the staves used are adjacent to each other. Compare in Figure 19 bar 15, beats two and four, where a continuous musical line runs across the top two staves. This looks a lot neater than in the first beat of bar 15, where the line jumps up two staves from the bottom to the second top. Additionally, beaming across many staves can introduce spacing issues when there is more than one simultaneous musical line. In the Figure 19 an awkward clash is avoided in the first beat of bar 15 due to the rhythms of the two lines.

The following staff order is the one that I believe produces the fewest cross-staff beaming compromises for the entire score:

1. Glockenspiel (including tone bars if necessary)
2. Vibraphone
3. Percussion (anything that is not covered by the other staves)
4. Blocks (wood and temple)
5. Drums (roto toms, tom toms and chamber bass drum)
6. Gongs
Murfin (2015) makes two important points about the relationship between the position of instruments. Regarding their position on the score, he states that:

it is very intuitive to order instruments on a staff so that higher lines and spaces correspond to higher pitched instruments in the setup. However, it is possible that by using such a system, the visual hierarchy of the staff will not correspond in an intuitive manner to the most optimal instrument layout. (p. 6)

Concerning the relationship between pitch and physical position within a setup, he prefers to follow the example of keyboard percussion instruments where possible:

in a setup consisting of multiple-percussion instruments, it is quite possible for such a configuration (lower pitched instruments on the left, higher pitched instruments on the right) to be physically impractical in regard to the passages that must be executed. (p. 6)

In other words, there are ideals that may or may not be accommodated by the instruments used. These ideas can be extended to the use of multiple staves, where ideally, the higher pitched instruments would be both higher on the page as well as to the right in the instrumental setup.

Fortunately, the staff order that produces the neatest looking music also places the highest pitched instruments at the top of the score. In my setup, this also places the highest pitched instruments on the right.

![Figure 20. Instrument Setup Diagram Showing Staff Order](image)

Cross-staff beaming is an excellent tool in multiple percussion writing to show the movement of a musical line from one staff to another. However, crotchets, minims, and longer notes do not use beams and therefore cannot be beamed across staves. An example of
this is shown in Figure 21, which is a typeset version of the prepared piano score (the first four bars of *Sonata V*).

![Figure 21. Sonata V Bars 1-4 (As Notated for Prepared Piano)](image)

It is clear that there is a melody and accompaniment, however this is not so apparent in my first version of the adaptation, shown in Figure 22.

![Figure 22. Lack of Cross-Staff Beaming in Sonata V, Bars 1-4](image)

Changing the note values to those that could be beamed across staves was considered. However, this change of note length from the prepared piano to multiple percussion score
could be interpreted by the performer that the vibraphone notes should be shortened, which is not the case. Tying notes together appeared to be the solution to this problem, however, the score then appeared very messy due to the overuse of ties. It is important to note that the ideas explained in Figures 23 to 25 did not appear in any version of the score. Rather, they were ideas that I was considering. Some aspects of these examples (such as the number of lines of the tom tom staff) are simplified.

**Figure 23.** Changing Note Values to Enable Beaming in *Sonata V*, Bars 1-4

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**Figure 24.** Changing Note Values (With Ties) to Enable Beaming in *Sonata V*, Bars 1-4

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Another possible solution was the diminution of the time signature. This allowed all notes appear shorter and therefore able to be beamed. In this case the time signature was changed from two minims in the bar to two crotchets. This is shown in Figure 25.

Figure 25. Diminution of Time Signature in Sonata V, Bars 1-4

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In this particular example, diminution of the time signature works extremely well as there are no notes shorter than a quaver in the original prepared piano score. However, in other movements diminution of the time signature would result in the use of absurdly short note lengths, so this method was abandoned.

In 2010, it was suggested that dashed lines could be employed in order to show the movement of a melodic line for notes that are not able to be beamed. I considered this for several years before deciding not to employ these lines. The justification for this is that while I would employ cross-staff beaming where practical, any further addition to the score would complicate what was already a crowded space. Sonata V does not have many notes and the page could have accommodated the dashed lines quite comfortably. However, I wanted my notation style to be consistent throughout the movements – either they all used dashed lines or none of them did.
Having investigated all of the previous options, I decided on reflection that the notational clarity of the melodic line was not essential. If a performer wishes to clarify any section of any movement, they can do so with reference to the prepared piano score. As *Sonatas and Interludes* is one of the most popular prepared piano compositions, sourcing a score will not be a problem. Had I been arranging a prepared piano composition that was not so widely available, I would be more conscientious in my clarification of score details.

**Elimination of Staves**

Towards the end of the adaptation process, I noticed that there was a lot of white space in the music where a certain staff would not have any notes for a long period of time. I thought about deleting a staff when it did not play in a system of music, much like it is in pocket orchestral scores. However, I decided against this, as some of the adaptation has only a couple of bars per system, as opposed to orchestral music, which usually has many more. As a compromise I decided that the number of staves would be set at the beginning of each movement. If a specific staff was not required for the entire movement then it would not be employed.

The easy identification of staves was an aim in my adaptation, as not all of them would be employed in each movement. The following table demonstrates the visual differences between the different staves. Note that the glockenspiel staff employs a two-octave transposed treble staff. Standard glockenspiel repertoire is notated using a conventional treble clef. The glockenspiel is considered a transposing instrument at the interval of two octaves. However, I employed the unusual clef in order to differentiate this staff from that of the vibraphone, which sits directly below in the staff order.
Table 4

**Visual Differences Between Staves**

<table>
<thead>
<tr>
<th>Instrument(s)</th>
<th>Clef</th>
<th>Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glockenspiel / Tone Bars</td>
<td>Treble (15ma)</td>
<td>5</td>
</tr>
<tr>
<td>Vibraphone</td>
<td>Treble</td>
<td>5</td>
</tr>
<tr>
<td>Percussion</td>
<td>Percussion</td>
<td>5</td>
</tr>
<tr>
<td>Blocks</td>
<td>Percussion</td>
<td>3</td>
</tr>
<tr>
<td>Drums</td>
<td>Percussion</td>
<td>4</td>
</tr>
<tr>
<td>Gongs</td>
<td>Percussion</td>
<td>1</td>
</tr>
</tbody>
</table>

Whilst it was due to good fortune that each of the staves ended up looking unique, such an opportunity should be grasped as multiple percussion scores can be difficult to navigate.

**Minimising Unnecessary Directions**

I have always attempted to make my score as clutter-free as possible. As discussed in Chapter 3, it is assumed that a dynamic marking will continue for a staff until contradicted. I have continued this approach with mallet numbering. Many multiple percussion scores do not specify the mallets to be used and do not contain any mallet numberings. However, as I am attempting to replicate a particular sound, the type of mallet used is of utmost importance. Therefore I have provided a list of mallets required at the beginning of each movement. To minimise the number of mallet numberings in the score, it is assumed that a notated mallet number continues for a particular staff until contradicted. Where chords are used, it is assumed that a notated set of mallets continues for that number of simultaneous notes only. Figures 26 and 37 show the difference between the notated and interpreted mallet numberings.
Another, less complex way of simplifying the look of the score is to remove the slashes of the grace notes. I expect that performers of my percussion score will be constantly consulting Cage’s prepared piano score (as well as the source recording). For such performers it is clear that Cage employs slashes in the original.

**Summary**

Along with the treatment of dynamics and pitch contour, the notation style of *Sonatas and Interludes* has evolved over the years. The primary difference with the treatment of
notation style is that work’s origin as a prepared piano composition does not matter overly much. This has allowed me to incorporate ideas from many writers who discussed multiple percussion in general. Various ideas have been considered in distinct areas such as staff identification, cross-staff beaming, and elimination of staves. Where a decision has been made, alternate choices are discussed and a rationale is given as to why a certain path has been followed.

This chapter has demonstrated how the look of the score has evolved since commencing the adaptation through examination of specific examples. Having reached the end of the reflective section, the inevitable next step is to unpack how the approaches towards dynamics, phrase contour, and notation have evolved together, using larger examples. This will be discussed in the next chapter.
Chapter 6: Evolution of the Score

The previous three chapters have investigated, in detail, some of the questions that were addressed during the adaptation process of *Sonatas and Interludes*. The answers to these questions have influenced the resulting adaptation. This chapter presents two excerpts of my adaptation, the end of *Sonata V* and the beginning of *Sonata VI*, as representative examples of the evolution of the score. As the answers to my questions evolved, so did the adaptation.

**Example 1: Sonata V, Bars 32-40**

**2004 Version**

Figures 28 and 29 show the adaptation in its 2004 iteration. They are included as separate figures as bars 32-40 span two pages in this version of the score. The top staff is for the vibraphone, the third staff is for five tom toms, and the lowest staff is for three gongs. The second staff contains assorted percussion. From the top it contains five temple blocks, sleigh bells, and a wood block.

*Figure 28. Sonata V (2004 Version), Bars 32-36*
Considering the issues described in the previous chapters, a few problems are clear. Even though this movement was notated as a stand-alone example (the idea of adapting all twenty movements of *Sonatas and Interludes* had not occurred to me in early 2004), staff usage is problematic. None of the lower three staves need all of the five lines that are allocated, wasting vertical space. The percussion staff is required to notate seven instruments, which can be accommodated on three lines. Similarly, the five tom toms require only two lines, and the three gongs need only one.

The percussion staff is especially confusing to the performer. Not only are too many lines employed, but ledger lines are unnecessarily used. Additionally, the order of instruments on this staff is illogical. The wood blocks are similar in timbre to the temple blocks, but on this staff they are separated by the sleigh bells. Why not keep the blocks...
together? A more logical system would be to place the sleigh bells highest on the staff, followed by the wood block which is high pitched, followed by the temple blocks, which are lower in pitch.

Dynamics are copied across from the original score (incorrectly), with accents being ignored. There is no use of cross-staff beaming and the G in bar 37 should be a grace note, rather than coinciding with the D.

2012 Version

The 2012 version of the score, shown in Figure 30, differs quite markedly from its predecessor. I had changed from using Finale notation software to Lilypond, which affected the overall look of the score. The top staff is still used for the vibraphone, the second is for the sleigh bells, the third contains one wood block and three temple blocks, the fourth is used for five tom toms, and the lowest staff is for a gong.

![Figure 30. Sonata V (2012 Version), Bars 31-40](image)
The instrumentation is changed slightly from the 2004 version, with two temple blocks and two gongs no longer being used. By 2012 I had adapted all of the movements and was using a universal notational key for all twenty movements, including the use of six staves (the glockenspiel staff is not used in this movement and is therefore absent). This explains the seemingly inefficient use of vertical space. In fact, each staff contains the bare minimum of lines required and there is no use of ledger lines. Additionally, the woodblock is placed at the top of the blocks staff, with the temple blocks at the bottom. Cross-staff beaming is employed to help emphasise the fact that there is a clear melody and accompaniment in this movement.

The 2012 version of the score does not contain any dynamics, as I believed that I would simply be copying them from the score later. Similarly, there are no accents or ghost notes. The grace note in bar 37 is now notated the same way as in Cage’s score. Also in bar 37, the C has been joined by an E. This was due to me hearing this note along with the C, which I had previously not considered important enough to notate.

**Current Version**

Figure 31 shows the current version of the score. The staff layout is maintained from the 2012 iteration, however the notation of the blocks is slightly different. In 2012 I specified that the three temple blocks should be the lowest three out of the overall setup (which includes four temple blocks). The current version of the score does not specify which three out of the four blocks should be employed, however, the pitch relationships between them need to be as notated on the score. In addition, the blocks are notated as high as possible. For example, in bar 32 there are three temple blocks in a row. The ascending order notated should be reflected in the choice of blocks. There is also a change in instrumentation for bars 32-35.
Figure 31. Sonata V (Current Version), Bars 31-40

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Dynamics are added back in, both in terms of overall markings such as fortissimo as well as note specific markings such as accents and ghost notes. In this excerpt the overall dynamic markings are identical to those on the prepared piano score, however the note specific markings vary slightly. This is due to my interpretation of the recording being slightly different to how Cage notated the prepared piano score. The first note of bar 32 is missing an accent in one of the notes, whereas both notes in the prepared piano score are accented. The first note of bar 37 is also treated differently, as an accented note on the
prepared piano score is interpreted as a two note chord with one note unaccented and one note ghosted.

Mallet numberings are also included in this version of the score. As discussed previously, these are not commonly included in multiple percussion scores. They are important in my adaptation as I have used specific mallets to help recreate a desired timbre. Mallet numberings are only included when a mallet changes in a particular staff (for that number of mallets used simultaneously). For example, in bar 32, the blocks change to mallet 2 for single notes. In bar 33, two notes on the block staff are played simultaneously (for the first time in this movement), so mallet numberings are given. Bar 34 has two single notes, which would be played with mallet 2 (the last single mallet marking), but for the mallet 3 marking over the top of the first note.

The last four bars are treated a little differently to the 2012 version. A ghosted G is added to the B in bar 38 in order to emphasise the “I – V – I” cadence. I had heard this G before, but didn’t consider it important until I reassessed the tonality of this movement. Additionally, I have added some extra tied notes to emphasise exactly how long I intend the notes to last. In Cage’s prepared piano score, the grace note G in bar 37 is not tied to any other notes. However, the pedal is held through bars 37 and 38, releasing the note before bar 39. A piano is able to perform a combination of releasing and holding notes through holding some notes down with the fingers while releasing the pedal (which is exactly what Cage does). This is not possible on the vibraphone, therefore I had to notate using ties rather than with a pedal marking. The performer can allow certain notes to sustain while employing mallet dampening on others. The grace note in bar 37 has also lost its slash in order to make the score a little more legible.
Example 2: *Sonata VI, Bars 1-2*

**2012 Version**

I started work on this movement in 2010, therefore it was never notated in Finale. The earliest version was completed in 2012, with the first three bars demonstrated in Figure 32.

![Figure 32. Sonata VI (2012 Version), Bars 1-3](image)

There are some obvious cosmetic errors in this example. The glockenspiel rests in the anacrusis and bar 2 do not match the percussion, blocks and tom tom staves. Additionally, the whole bar rests in the tom tom staff are positioned incorrectly and there is an obscured rest in bar 2 of the gong staff.

**Current Version**

Figure 33 shows the latest version of the score.
Figure 33. *Sonata VI* (Current Version), Bars 1-2

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Compared with the 2012 version of the score, the vibraphone staff has been added, as the instrument is used later in the movement. Additionally, the entire score has been adjusted to take up more horizontal space. The justification for this is that in the 2012 version, this movement looked a lot more crowded than those adjacent in the score. The effect is that the first system of the current version of the score only extends to bar 2, rather than bar 3 in the 2012 version. Staff names have been eliminated in the current version, as the staves can be read by their clef and number of lines.

The cosmetic deficiencies of the 2012 version have been corrected, with rests now being consistent throughout the staves. Additionally, the vertical positioning of whole bar rests has been adjusted. They look a little strange on a four-line staff, with the minim and
whole bar rests surrounding the same, rather than adjacent lines. This is an aesthetic judgement, as I felt that this choice of rest placement was most easily read.

Some instruments have been changed over the course of time. In the percussion staff, the tambourine was changed to high sleigh bells (rattle type). Although the timbre of the two instruments is similar, I felt that the delicate nature of the sleigh bells suited the mood of the movement a little better. Further down in the percussion staff, the metal of bar 2 has moved up a staff position. This is a result of me no longer choosing an exact subset of instruments, as discussed in detail towards the end of Chapter 4. In 2012, I chose the lowest four of the five metals. In the current version of the score that choice is left up to the performer. They can choose any four of the five metals for this movement, with the only stipulation being that they must be in the pitch order indicated in the score (highest sounding pitch is notated higher). Moving to the tom tom staff, there are a few instrumental differences. The roto toms are now employed (in B2, D3, and B3, where Middle C is C4), in order to help emphasise the tonality of the movement, which has a B Phrygian feel. The pitch ordering of the drums has also been adjusted slightly.

The 2012 version is notable for its lack of dynamics and mallet numberings. This has been rectified in the current version. As the example is from the beginning of the movement, dynamics and mallet numberings need to be set. The roto toms use a cord-wound mallet, whereas the toms use hard rubber. This is to emphasise the bass line (and tonality) role of the roto toms. The glockenspiel uses both hard rubber and (even harder) polyball, with the latter being used to emphasise what I consider to be the melodic line. Note that this involves crossing the hands in bar 1, as this movement employs two mallets in each hand. This technical difficulty has been worked through physically in order to ensure that the adaptation is performable.
Summary

My adaptation has changed remarkably in the fourteen years since I commenced work on it. Nearly every aspect has been investigated and refined over several iterations. While it is impossible to present an evolution of every movement, the two examples highlighted in this chapter should serve as a representative sample of the thought that has gone into the current version. Volume 2 of my research, a complete performance score with detailed legend presents a much more extensive result of the investigations explored in the previous four chapters.
Chapter 7: Conclusion

**Topic Question Answered**

How does one adapt *Sonatas and Interludes* for solo multiple percussion? The answer is through making a series of decisions throughout the adaptation process.

The first and possibly most important decision to be made is the selection of a source recording. Due to the nature of the prepared piano, the sounds produced in different recordings vary considerably – more so than those of any other instrument. Additionally, there are different ways of specifying what sounds are to be produced. Cage himself varied the specificity of preparation notation. Some compositions, such as *Bacchanale* encourage experimentation to find the correct sound, whereas others, such as *In the Name of the Holocaust*, detail a preparation material as well as a desired sound (Cage, 1960b). However, in *Sonatas and Interludes*, he describes the preparation material and location, without specifying a sound. The material is described quite broadly (“bolt” for example) and the timbre can be affected by the type and size of preparation material, as well as the piano.

After a source recording is selected, the adapter is required to make decisions concerning some of the basic elements of sound – pitch and volume. The prepared piano is unusual in that both of these elements sound differently to how they look on the score. Additionally, these vary from recording to recording, as previously noted. The strictness of the interpretation can vary along a continuum from approximate to precise, with the position along this continuum being chosen by the adapter. The interpretation of dynamics by a prepared pianist is different to that of a percussionist, which must also be taken into account.

Once the adaptation approach is determined, many decisions need to be made concerning the notation of the multiple percussion score. Due to the number of movements contained in the composition and the large amount of preparations regularly employed in a
prepared piano work (implying a large number of percussion instruments), these decisions are required regardless of the source composition used. The overall framework of the adaptation process, including score organisation, pitch relativity and dynamic interpretation may involve multiple iterations.

**Learning Outcomes**

An important early realisation was that this project has very little in common with any other published writing that I have encountered. Other dissertations that I had read appeared to share many similarities with predecessors. They usually differed by updating previous research or providing a different approach to existing material. Usually there was more than one precedent and this was generally set out in the literature review. However, when starting my research, I found that this was not the case.

As discussed previously, there are a few related projects, such as the music of the Clocked Out Duo (2002) and an adaptation by Eduardo Leandro (n.d.) of sections of *Sonatas and Interludes* for prepared quarter tone marimba. However, as far as I have been able to ascertain, there is no published adaptation of a prepared piano composition for solo multiple percussion. Therefore I have been forced to fragment my research into individual areas of study, as set out in Chapter 1 in the survey of relevant literature. These included the prepared piano, the adaptation process, and multiple percussion. Each of these have their own precedents, which have been discussed in the dissertation, however, there is currently little overlap between these areas of research.

A major realisation was the sheer multitude of decisions that had to be made concerning almost every aspect of the adaptation. Some of these involved selecting from a set of choices, such as in the notation section, when I had to decide how to manage more instruments than would fit on a single five line staff. More interestingly, others involved choosing one of many options that lay on a continuum. The prime examples of these are the
interpretation of dynamics and pitch. In both of these areas I had considered a very loose interpretation of the original music, basically copying what I had seen in the written score. For both dynamics and pitch, this proved a totally inadequate method of approaching the music. Alternately, I attempted to create an almost exact interpretation of what I heard in the audio recording. For pitch this involved ordering all of the percussion instruments from high to low, whereas for dynamics this involved determining relative amplitudes for each note. In the case of dynamics I gave up at this point, realising that dynamic markings for each individual note were impractical. Concerning pitch, a few movements were completed using this rigid method, but I quickly abandoned it. For both of these areas I compromised on a position in the middle of the continuum. Situating my approach to adaptation, pitch, and dynamics with respect to historical attitudes was important, considering the relative lack of existing sources.

From reading other dissertations it appears that this project is unusual in that it did not start its life as a dissertation project. Instead, it began as a stand-alone adaptation of a single movement of Sonatas and Interludes. It then grew into an adaptation of the entire composition.

The most surprising thing that I have learned is just how similar the prepared piano and multiple percussion are. The reason that I started my adaptation in the first place was because I thought that a recording of Sonata V was a percussion piece. The instruments do have the potential to sound similar, however the resemblance does not stop there. Nearly every aspect of the instruments are the same. Multiple percussion has no defined ‘look’, as a violin or trumpet does. The exterior of a prepared piano may look familiar, however there is no defined look to the interior, where any number and type of preparations may be employed. The sound is also unpredictable. There is no defined limit to the scope and range of
percussion instruments used in a setup, with the prepared piano being similar in respect to this.

Both instruments have the potential to combine pitch-based and timbre-based tones. With multiple percussion this can be achieved through the use of keyboard instruments. Not all of the prepared piano’s notes need be prepared, leaving unprepared notes that can sound like a conventional piano. Additionally, some prepared notes can still have a defined (but possibly different to notated) pitch. Likewise, percussion instruments such as woodblocks and cowbells can also have a defined pitch.

The notation of both instruments is different to that of a conventional instrument. As discussed in Chapter 4, there is a complete break with a thousand-year-old convention of higher pitches being notated higher on the staff. Sometimes this does happen, as with keyboard percussion instruments, multiple sizes of the same percussion instrument, or unprepared piano notes. However, sometimes this convention is completely ignored.

Both instruments also share an unpredictable dynamic palette, depending on the percussion instruments or preparations used. In fact, the biggest difference between the prepared piano and multiple percussion lay not with the instruments themselves, rather with the attitudes of their performers to dynamic markings.

**Opportunities for Future Research**

The areas of further research stemming from this project can be divided into two broad categories; related forms of adaptation as well as the extension of individual aspects of the research.

An obvious follow-on from the research would be the adaptation of another of Cage’s prepared piano works for solo multiple percussion, using the appropriate ideas from this research to inform the adaptation. His *Concerto for Prepared Piano and Chamber Orchestra* (Cage, 1960a) is an example of such a composition. Earlier works such as *Bacchanale* are
both shorter in length and contain fewer prepared notes, making them easier to adapt to percussion. Cage may have developed the prepared piano, and he may have written its most famous compositions, but he is by no means the only composer for the instrument. Many other composers have written works for the prepared piano that could be adapted for multiple percussion. Some of Aphex Twin’s prepared piano music on the album *drukqs* (2001) sounds very adaptable to percussion instruments. However, not all prepared piano music lends itself to adaption for solo multiple percussion. Some of the repertoire does not sound like percussion music and some of it would require a setup that is too large to be manageable by a single performer. This second problem could be alleviated by using an ensemble of multiple percussionists. Additionally, there is music for multiple prepared pianos, such as Cage’s *A Book of Music*, the adaptation of which would present additional complications.

Moving further away from this project, there is no reason that the adaptation process has to be identical to the way pursued in this document. Why not reverse the process and adapt percussion music for the prepared piano? A piece that would work well is Xenakis’s *Rebonds* (1991). This piece has a very limited instrumentation and could fit quite easily under the hands. Once again, there is no reason why the numbers of performers need to be the same when adapting, so a single pianist could attempt certain percussion ensemble repertoire.

Another idea is the combination of the prepared piano and percussion instruments under the control of a single performer. Certain organs have percussion effects under the control of a keyboard, so such mechanisms already exist. Alternately, the prepared piano could be augmented by the implementation of a multiple percussion setup surrounding the instrument. The most obvious instruments to employ would be those played by the hands, although mallets could also be used.

Prepared piano and multiple percussion are not the only two timbre-based instruments. The voice and turntables are two examples of instruments that can be used in a percussive
way. There has been interesting research concerning the notation of turntablism, which would allow any adaption to that instrument to be recreated accurately. Kurt Schwitters’s Ursonate (1922-1932), a work for solo voice, has been adapted by Vanessa Tomlinson (1996) with the voice part being doubled by percussion and there are numerous composed works where a recorded voice is mimicked using percussion instruments, such as Vinko Globokar’s Toucher (1973).

Certain individual aspects of this research could be examined in a more detailed manner. Previous chapters have investigated the effect that a piano preparation has on pitch and volume of a single note. However, there is ample scope for further research. In particular, the pitch variations between various recordings of Sonatas and Interludes could be researched in a much more detailed manner. There is also a great deal of opportunity for research into the interpretation of dynamic markings by composers. Dynamic markings prior to the twentieth century appear to have been less standardised, with the education (and possibly library) of a composer being pivotal in forming their interpretation and notation of dynamics. Additionally, I am certain that a large-scale exploration into adaptation, its etymology and rationale would make fascinating reading.

Finally, I was determined not to discuss the translation of timbre from the prepared piano to multiple percussion. While pitch and volume could be discussed objectively, timbre seemed a bit too intuitive to discuss in such a way. Rather than attempt a poor approximation of intuition, I decided to omit such a discussion. However, this does not mean that research in this area is futile. In fact, an exposition on the topic of timbre would be a worthwhile addition to the existing literature.

While pitch-based adaptation is a common part of a musician’s career, timbre-based adaptation is a relatively new, untapped resource that deserves far more attention in the future.
It is my hope that this document has helped explain the process of creating one such adaptation and that it will serve as a springboard to further exploration.
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