Temporal Structuring in A Portfolio of Original Compositions

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Summary of thesis

This thesis consists of a portfolio of ten compositions, ranging in duration and instrumentation, accompanied by a written commentary, and (where possible) audio recordings of these pieces. Influenced by my concern to connect with physical movement, as well as develop my rhythmic practice, the portfolio investigates rhythm as a controller of form. The pieces contained within are informed by the principal concepts set for exploration for the duration of my PhD research: systematic rhythmic processes to guide both large-scale and local design, repetition as a function of form within long-range processes of continuity, as well as the significance of the perception of these processes.

This commentary divides aspects of my research into five chapters. **Chapter One** outlines my influences and provides a context for my research aims. **Chapter Two** traces the evolution of my use of systematic rhythmic processes, specifically addressing approaches to long-range temporal structure in works spanning the entire duration of my PhD. Following this, **Chapter Three** considers additional concerns of approach to temporal structure in pieces written in response to other art forms including poetry and visual arts. Systematic uses of pitch material, particularly concerning how pitch relates to the perception of treatments of time are investigated in **Chapter Four**. The final chapter, **Chapter Five**, provides an analysis of my monodrama *The Yellow Wallpaper* within the context of the previously considered topics. Lastly, future paths for further exploration are considered in the conclusion of this thesis.

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Introduction

This thesis traces a path commenced at the beginning of my postgraduate studies, which led to an intentional shift in focus to the development of my rhythmic practice. Coming to composition relatively late as an undergraduate, I was encouraged to immerse myself in sound, often starting at the piano to compose an 'idea', usually a sequence of chords devoid of rhythm to govern the construction of a composition. I am grateful for these initial years, which allowed intuitive exploration; however, moving to the UK as part of my Master of Arts degree at the University of Bristol introduced new approaches to composition, particularly systematic processes which have shaped my compositional voice and introduced the necessary tools to realise my current aesthetic. While my approach, particularly to harmony, is still rather intuitive, investigations of systematic processes during the extent of my PhD research have revealed new possibilities for the handling of materials. These discoveries have facilitated the creation of music that is more aligned with that to which I am naturally drawn to listen and want to create.

A range of compositional influences can be traced in the works presented as part of the portfolio. The rhythmic practices of Igor Stravinsky, Elliott Carter, Harrison Birtwistle, Arlene Sierra, and Tansy Davies, among others, have been of particular interest, as well as the theatre works of Peter Maxwell Davies and Judith Weir. Other notable influences include 15 years of receiving and providing dance instruction, which naturally feeds into the way I approach and think about music, often connecting with physical movement in some way. Additionally, my extended experience with choral singing affects the way I think about expressive line. These two early influences contextualise my strong feeling for linear development.

These influences have motivated the principal concepts set for exploration for the duration of my PhD research: systematic rhythmic processes to guide both large-scale and local design, repetition as a function of form within long-range processes of continuity, as well as the significance of the perception of these processes. While experimenting with the techniques discussed in this commentary, my ultimate goal has been to amalgamate these methodologies with a distinct compositional voice.

The portfolio contains ten works informed by the research topics mentioned ranging in duration and size of ensemble, the instrumentation of which were not always of my choosing, but instead determined by workshop and performance opportunities. Serving as primary research for specific concepts, certain works are presented as exemplary case studies and are therefore discussed at greater length than others, while subsequent pieces trace their lineage to results achieved there. As some pieces align more to particular topics than others, I will discuss some pieces in detail concerning specific topics but make more broad mention regarding other features.

This commentary divides aspects of my research into five chapters. **Chapter One** outlines my influences and provides a context for my research aims. **Chapter Two** traces the evolution of my use of systematic rhythmic processes, specifically addressing approaches to long-range temporal structure in works spanning the entire duration of my PhD. Following this, **Chapter Three** considers additional concerns of approach to temporal structure in pieces written in response to other art forms including poetry and visual arts. Systematic uses of pitch material, particularly concerning how pitch relates to the perception of treatments of time are investigated in **Chapter Four**. The final chapter, **Chapter Five**, provides an analysis of my monodrama *The Yellow Wallpaper* within the context of the previously considered topics. Lastly, future paths for further exploration are considered in the conclusion of this thesis.

Chapter 1 – Research Aims and Context

Two fundamental motivations have been combined to guide the chosen research aims for the extent of my PhD research. The first concern is my desire to connect with physical movement. By this, I do not mean writing music for dance, necessarily, or connecting with the physical action required to produce sound, but instead, I aim to evoke motion in my music. I have sought to combine this desire with my second principal concern, an intentional shift in focus to the development of my rhythmic practice, through an investigation of rhythm as a controller of form. The perception of progression divorced from the harmonic implications of tonal harmony became a significant consideration, which has led to the primary research aims: investigations of systematic rhythmic processes to guide both large-scale and local design, repetition as a function of form within long-range processes of continuity, as well as the significance of the perception of these processes. This initial chapter in no way attempts to provide a detailed survey of the vast lineage of composers at the forefront of novel explorations in the field of rhythm. Rather, this chapter provides a concise contextualization of the practices of a select few composers for which I have a personal proclivity and whose influence is conscious and can be traced in the pieces which comprise the portfolio.

Rhythm as Controller of Form

Rhythm as a controller of form is not a new idea. For example, isorhythm**,** a logical outgrowth of the rhythmic modes that governed most late medieval polyphony, first appeared in thirteenth-century motets. Isorhythm became the preferred structure of the motet in the fourteenth century, featuring a repeating rhythmic pattern and an

independent repeating pitch pattern in the tenor, often of differing lengths. Abandoning all modal limitations, the isorhythmic motet of the fourteenth century managed to derive decisive structural benefit from the systematic application of given rhythmic patterns. The technique featured in most of the motets of Guillaume de Machaut, including his *Messe de Nostre* in which an additional isorhythmic voice, the countertenor, was added. Instances of isorhythm occurred as late as the early work of the fifteenth-century composer Guillaume Dufay in whose works upper voices become increasingly involved in isorhythmic organization.

Many composers of the twentieth and twenty-first centuries have incorporated such medieval techniques into their own structural rhythmic practice. For example, the cello and piano in the first movement of Olivier Messiaen's *Quatuor pour la fin du temps* feature independent patterns resembling isorhythms while the clarinet and violin imitate the songs of birds.[1] The combined effect of these patterns creates a sort of aural paradox between motion and stasis, serving as a suitable metaphor considering the conditions under which the piece was composed.

Other examples of twentieth-century use of isorhythm can be found in the music of George Crumb. For instance, in the first madrigal of Book Three of *Madrigals*, two instrumental isorhythms of different lengths are used, while the voice floats unencumbered above. Crumb specifically acknowledges the influence of the isorhythmic technique in his note for *Music for a Summer Evening (Makrokosmos III).* The fourth movement 'Myth' consists of three simultaneous taleas.[2] Describing the movement as 'atavistic', Crumb details its function as one of two intermezzos within the overall sequence of movements stating it was conceived as a 'dream-like' piece.

[1] The cello cycles through the same five-note sequence and a repeating pattern of fifteen durations, whereas the piano part consists of a seventeen-note rhythmic pattern permuted strictly through twenty-nine chords.

[2] Talea is the term used in the Medieval era to denote the rhythmic pattern of an isorhythmic motet.

The idea of incorporating isorhythm into the structure of a 'dream-like' piece is intriguing to me, as the use of the technique by both Crumb and Messiaen suggest opportunities to manipulate the perception of the passing of time. The influence of isorhythm is apparent in my own work as well, specifically the process of repeating two sets of parameters (duration and pitch) at different rates. As a result of this process, the values of one parameter are associated with different values of the other parameter at each repetition. Chapter Four provides further discussion of my use of this process in *Up and Down and Sideways* and how it relates to the narrative of the piece.

Since the disintegration of harmonic common practice in the early part of the twentieth century, the parameter of time has been a particular preoccupation for many other composers as well. Jonathan Cross boasts one composer's influence above others noting the scarcity of composers who have not been influenced by Igor Stravinsky's *The Rite of Spring*:

> '*The Rite* indicated – in a way that had not been true since medieval times – that, in Boulez's words, rhythm could act as a "principal structural agent." It certainly seems probable that, without Stravinsky's complete reinterpretation of the role of rhythm in music, the advances of much music since World War 2 would simply not have been possible'.[3]

Cross supports this statement with a survey of the influence of *The Rite* on the rhythmic practices of composers such as Boulez, Messiaen, Varése, Ligeti, and Carter, among others, considering the impact of Stravinsky's highly characteristic devices of successive, sharply differentiated blocks of musical material and simultaneous juxtaposition of clearly differentiated musical materials in musical layers or strata.[4]

[3] Jonathan Cross, *The Stravinsky Legacy* (Cambridge: Cambridge University Press, 1998), p. 81.
[4] Ibid., pp. 88-131.

Concern for Large-Scale Continuity

The coordination of stratified elements can be traced in Elliott Carter's Cello Sonata (1948) in which the cello plays a rhapsodic, expressive line against a regular clock-like ticking in the piano. This breakthrough piece established many of the ideas that would identify the beginning of his long gestation into the true role of time in music.[5] Around 1944 Carter became concerned that composers were only consciously interested with 'this or that peculiar local rhythmic combination or sound-texture or novel harmony and had forgotten that the really interesting thing about music is the time of it—the way it all goes along'.[6] He purported that while contemporary composers had explored 'every imaginable kind of harmonic and timbral combination' there had been only a degree of rhythmic innovation on the local level in the music of Stravinsky, Bartók, Varese, and Ives. Carter stated further that 'the way all this went together at the next higher and succeeding higher rhythmic levels remained in the orbit of what had begun to seem to [him] the rather limited rhythmic routine of previous Western music'.[7] Bothered by what seemed to him to be a general lack of concern in larger-scale time continuities, Carter's first great stride in the direction of controlling large-scale rhythmic structure was metric modulation, which he found created a convincing musical logic appropriate to the richness of the modern musical vocabulary.[8] A logical

[5] Jonathan W. Bernard, 'The Evolution of Elliott Carter's Rhythmic Practice', *Perspectives of New Music*, 26/2 (1988), 164-203 (pp. 164-166).
[6] Allen Edwards, *Flawed Words and Stubborn Sounds: A Conversation with Elliott Carter* (New York: Norton, 1971), p. 90; quoted in Jonathan Bernard, 'Elliott Carter and the Modern Meaning of Time', *Musical Quarterly*, 79/4 (1995), 644-682 (p. 644).
[7] Ibid., pp. 90-91.
[8] Bernard, pp. 167-197 traces the development and treatment of metric modulation in each work from the Cello Sonata of 1948 to the Double Concerto of 1961.

continuation of this exploration, long-range polyrhythms later became the central focus of Carter's rhythmic planning to guide both large-scale and local rhythmic design.[9]

Carter's exploration of musical time has profoundly influenced the evolution of my own rhythmic practice as further detailed in Chapter Two. Particularly the techniques of metric modulation and long-range polyrhythms have offered solutions to coordinate disparate elements in my own music, for which I am forever indebted to his contribution to the general community of contemporary composers.[10]

One important subject where Carter and I diverge, however, is his resilient avoidance of mechanical repetition. Seeming to him that society was being 'deluged by advertising, by propaganda,' Carter prided himself specifically to fight mechanical repetition in favour of liveliness and growth 'trying to reflex the human side of things'.[11] Nonetheless, he does acknowledge the function of repetition to support comprehensibility, continuity, and logical coherence; Carter's aversion to literal repetition is satisfied through the recurrence of certain speeds, textures or timbres, as well as their coordination to strengthen the perceptibility of structural markers.[12]

Repetition as a Function of Form within Long-Range Processes of Continuity

My attitude toward repetition is more aligned with other works from the late twentieth and early twenty-first centuries which feature pervasive repetition, particularly varied repetition of short gestures and ideas, as a function of form within

[9] John Link, 'Long-Range Polyrhythms in Elliott Carter's Recent Music', (PhD Dissertation, The City University of New York, 1994), pp. 2-5.

[10] Here I must also acknowledge the medieval roots of metric modulation, as proportional tempi date back to the mensurational innovations of the ars nova leading to the introduction of time signatures. See Cross, pp.125-128.

[11] *Elliott Carter: A Labyrinth of Time*. directed by Frank Scheffer, DVD, Juxtapositions DVD9DS17 (2006).

[12] Marguerite Boland, 'Ritornello form in Carter's *Boston* and *ASKO* concertos', in *Elliott Carter studies*, ed. Marguerite Boland and John Link (New York: University of Cambridge Press, 2012), 80-109 (pp. 82-86).

long-range processes of continuity. As detailed by Antares Leah Boyle, composers such as Luciano Berio, Pierre Boulez, Morton Feldman, Franco Donatoni, Harrison Birtwistle, and Salvatore Sciarrino, whose work while not conforming to a unified style, feature into compositions a wealth of diverse repetition strategies written in a late modernist post-tonal idiom including rhythms that often thwart conventional metric interpretations.[13] A specific composer's handling of this type of repetition from which I have drawn in my own work, for example in *Slowly Tilting, Sinking* further discussed in Chapter Two, is that of Harrison Birtwistle with whose work I was not familiar until moving to the UK. The context of mechanical-like repetition of the near-obsessive emphasis on the note E in the second movement of *Harrison's Clocks,* and the predominance of ostinatos based on single-pitch repetitions in *Tragoedia,* along with a wealth of other possible examples, offer a glimpse into Birtwistle's attitude toward the flow of musical time.

In response to a question about his understanding of clock time and psychological time, a concern also shared by Carter[14] as well as Stravinsky,[15] Birtwistle states his attitude to time is 'concerned with repetition – about how repetition changes our perception of how things happen'. He compares his attitude towards time in music as similar to viewing a painting in that one is 'progressing through time while you perceive it, and then you collect the experience in your mind into something timeless'.[16] An example of Birtwistle's exploration of clock time and experiential time can be found

[13] Antares Leah Boyle, 'Formation and Process in Repetitive Post-Tonal Music', (PhD Thesis, The University of British Columbia, 2018), pp. 1-4.
[14] Jonathan W. Bernard, 'Elliott Carter and the Modern Meaning of Time', *Musical Quarterly*, 79/4 (1995), 644–682 (pp.646-649).
[15] Igor Stravinsky, *Poetics of Music: In the Form of Six Lessons,* trans. Arthur Knodel and Ingolf Dahl (Cambridge, MA: Harvard University Press, 1947), pp. 28-32. See also Cross, pp. 81-83.
[16] Harrison Birtwistle and Ross Lorraine, 'Territorial Rites 2', *Musical Times*, 138/1857 (1997), 12-16 (p.13).

in *Chronometer*, a piece in which pulse is used to connote clock time, as discussed by Robert Adlington:

> 'The chimes of a clock, though obviously implicated in clock time (for they quantify its perpetual passage), also invoke memory, in a way that insistent local metrication does not. An hourly or quarterly chime implicitly refers back to a previous, remembered one. In Adorno's eyes, it is memory that holds the key to transcending clock time, for memory offers the opportunity of a 'gathering up' of experience, one that transcends the linear sprawl of existence connoted by the clock'.[17]

Aleksandra Vojcic posits that challenges to our clock-time sensibilities have been at the forefront of innovative explorations in the field of rhythm and have resulted in various process-oriented approaches, some of which may be characterised as musical mechanisms.[18] Her analysis of Birtwistle's *Harrison's Clocks* explores various relations between the concepts of clock time versus experiential time, metaphorical use of musical mechanisms, and fluctuations between moments of regularity and change:

> 'Birtwistle's work projects an idea that time-flow in a piece of music can explicitly function in two temporal realms: chronometric time derives from the pre-compositional activity, while the experiential time exists in the perceptual domain, aided by the various metaphorical layering of time-pieces or clock-inspired motives'.[19]

While all five movements of Birtwistle's *Clocks* are initiated by the same low, descending 'chime' gesture, repetition functions in different ways to support contrasting temporal goals in individual movements. For example, the opening musical mechanism of the first movement (beginning in bar 7) is emblematic of a type of a flexible rhythmic process, or a varied ostinato, that recurs frequently in the work, particularly in the outer

[17] Robert Adlington, *The Music of Harrison Birtwistle*, (Cambridge: Cambridge University Press, 2000), p. 99.
[18] Aleksandra Vojcic, 'A Sonorous Image of Time-Stretching in Birtwistle's *Harrison's Clocks*', *Perspectives of New Music,* 48/1 (2010), 5-43 (p.10).
[19] Ibid., p. 11.

movements, to support temporal motion.[20] Whereas, the repetition of the descending 'chime' gesture in the fourth movement functions to clearly articulate the four main sections through the disruption of the temporal flow.[21] Another significant point of investigation during the extent of my research has been this idea of contradictions between stasis and motion that are inherent in patterned repetition.

Heightened Rhythmic Continuity: Groove

Repetition is most obviously experienced as process when multiple iterations follow one another successively, for instance, in an ostinato. Ostinato-like repetition can create heightened rhythmic continuity or groove in certain passages of post-tonal music even when repetition is constantly varied, or expressed periodicities are inexact.[22] Building on the work of previous analysts of Birtwistle's music who have often focused on the temporality of repetition and the contrast between narrativity and cyclicity,[23] Boyle demonstrates how these variations often shape a passage by affording a groove's emergence or dissolution, shifting the balance between rhythmic continuity or segmentation, or altering the implied textural role of repeating material. Her analysis of Birtwistle's 'Frieze 3' from *Nine Movements for String Quartet* establishes that these effects can build direction across a passage or musical work, create contrast between different sections or parts in a texture, or encourage a participatory mode of listening in the music that follows even as it becomes less ostinato-like.[24]

[20] Ibid., p. 31.
[21] Ibid., p. 13.
[22] Boyle, pp. 185-194.
[23] For a summary of these approaches, see Rupprecht, Philip, 'Mechanical song: Birtwistle's rhythmic imagination', in *Harrison Birtwistle Studies*, ed. David Beard, Kenneth Gloag and Nicholas Jones (Cambridge: Cambridge University Press, 2015), 26-62 (pp.27–28).
[24] Boyle, pp. 275-305.

Other composers engaging with repetition and groove are Tansy Davies and Arlene Sierra. I first encountered Davies' music through her chamber piece *neon* at Bristol New Music Festival in 2014 and later within the context of conducting *grind show (unplugged)* as part of a course in 2017. Davies remarks that *neon* is 'about physical energy' which is manifest in a dialogue between the human body and machine, the former depicted in the foreground by a fragile and 'distressed' character, while repeating asymmetrical patterns represent the latter.[25] Throughout the piece, grooves are realised and dissolve within a series of interconnected boxes in which repeated patterns are layered. *Grind show*, written four years later, also represents Davies' affinity to manipulate groove perception through the layering of repetitive and asymmetrical patterns. In the programme note for the 'plugged' version of the piece, Davies speaks of superimposing two scenes: a 'bright' foreground scene in a 'bawdy' dance hall against a 'dark' rainy background landscape at night:

> 'While composing *grind show* I saw a painting by Goya: 'The St Isidore Pilgrimage', which shows a crowd of debauched and frightened revelers appearing to flee across the hills from a distant town. It's painted over an earlier landscape on which, in turn, the figures were superimposed.'[26]

The 'unplugged' version removes the dark layer, the electronics, to reveal instrumental dialogues of irregular patterns and dances. One of the principal attractions I have to Davies's music is her explicit acknowledgement of the influence of dance music on her aesthetic:

> 'Like a lot of my music, it's built up layer by layer, a bit like funk. But, whereas funk is incredibly tight, I make something very baggy. I like to keep people

[25] Tansy Davies, programme note to *neon* (London: Faber, 2013).
[26] Tansy Davies, programme note to *grind show (electric)* (London: Faber, 2010).

> guessing by suggesting a pulse, and then showing that actually the true pulse is somewhere else'.[27]

Arlene Sierra's works also project physicality and a sense of movement influenced by dance. A particularly noteworthy project is her ongoing series of scores for films by avant-garde filmmaker Maya Deren. Her rescoring of *Meditation on Violence* responds to the physical movement of a kung-fu master's practice, while *Ritual in Transfigured Time* explores a woman's journey from widow to bride 'via a series of fleeting encounters with past and future selves'.[28] Both scores engage with gradually shifting ostinatos which are organically layered in dynamic ways to create momentum in response to the films. These works have encouraged my exploration of different temporalities, as well as influenced my response to extra-musical stimuli.

Perception

In addition to film, Sierra also engages with other extra-musical materials, often taking inspiration from processes from the natural world. In response to a question about whether the stated influences of evolution and natural selection were apparent in hearing a piece, Sierra discusses her attitude to the perception of processes:

> 'That's up to the individual; it's certainly not required. There's a huge difference between a musical process and a musical program. What I'm composing with is process, not story. For me, extramusical concepts are a way to determine what the music does structurally. If people are open to that, it's great because it offers a way of listening analytically without having to know technical things about

[27] Ivan Hewett, 'I love to work out after a hard day of composing', *The Telegraph*, (1 February 2007) <www.telegraph.co.uk/culture/music/classicalmusic/3662880/I-love-to-work-out-after-a-hard-day-composing.html> [accessed 19 September 2016].

[28] Arlene Sierra, 'Maya Deren series', <www.arlenesierra.com/music/projects/maya-deren-series-ongoing.html> [accessed 29 September 2018].

> how music is put together. But the music is music whether you know how it works or not'.[29]

Sierra's response brings up another concern of my research, the significance of the perception of processes. While it is not vital to the understanding of a piece for structural processes inspired by extra-musical concepts to be acknowledged by the listener, it is essential to consider the perceptibility of the coordination of hierarchal structures to create momentum or, contrastingly, stasis. Jonathan Kramer discusses the importance of hierarchal structures to maintain progression as part of a wider discussion about different types of temporality. A temporality in which there is no inherent progression he terms 'vertical time'.[30] He goes on to specifically address a special kind of vertical music, 'process music' or 'trance music,' which is inherently repetitive:

> 'One might think of such works as pure linear time, but listening to them is not a linear process, despite their internal motion. Because in such pieces the motion is unceasing and its rate gradual and constant, and because there is no hierarchy of phrase structure, the temporality is more vertical than linear. The motion is so consistent that we lose any point of reference, any contact with faster or slower motion that might keep us aware of the directionality of the music. The experience is static despite the constant motion in the music'.[31]

Considering Kramer's categorisations of temporalities, throughout my discussion of individual pieces I will address considerations taken to strengthen the perceptibility of processes through differentiation of foreground and background, which are generally enforced by various strategies of repetition as well as referential uses of timbre.

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[29] Robert Schulslaper, 'Composer Arlene Sierra: Process, Strategy, Evolution', *Fanfare*, [accessed via <www.arlenesierra.com/docs/SIERRAfanfareinterview.pdf>, 19 September 2017].
[30] Jonathan D. Kramer, 'New Temporalities in Music', *Critical Inquiry*, 7/3 (1981), 539-556 (pp. 549-551).
[31] Ibid., pp. 552.

Practical Considerations

In addition to the before mentioned topics which contextualise my research interests, practicality in regards to playability is always a consideration that directs my compositional choices. After all, even experts of contemporary music performance struggled with Elliott Carter's rhythmic idiom. Concerning the playability of Carter's string quartets, Robert Mann, the former first violinist of the Juilliard Quartet, recalls spending two rehearsals with his colleagues just trying to master the first bar of his String Quartet No. 3.[32] Mann is not alone in his sentiments concerning the difficulty of Carter's rhythmic idiom. In his correspondence with Carter, Conlon Nancarrow, who had grappled with his own issues of achieving precision of interpretation by writing for player piano, pointed out that Carter's *First String Quartet* posed almost unsolvable problems for the performers believing that Carter had reached the utmost performing limits. Nancarrow claimed the dedication of the performers 'achieved the seemingly impossible, but [that] there is a point beyond which even dedication is not enough'.[33]

In broaching this topic, I do not mean to suggest that I advocate music that is purposefully easy or which dismisses risk-taking. On the contrary, I believe players want to be challenged, but a huge amount of reflection goes into practical considerations to support time-efficient preparation by performers without compromising my aesthetic. In this respect, it is clear I do not view composition as merely an academic exercise. The contents of this portfolio reflect my ultimate motivation to write music to be performed and heard by other people.

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[32] Anthony Tommasini, 'Music Review; Gobbling All Elliott Carter's Quartets Without Indigestion', *The New York Times*, (4 November 2002) <www.nytimes.com/2002/11/04/arts/music-review-gobbling-all-elliott-carter-s-quartets-without-indigestion.html> [accessed 7 September 2018].

[33] Dragana Stojanović-Novičić, 'The Carter-Nancarrow Correspondence', *American Music*, 29/1 (2011), 64–84 (p. 71).

Chapter 2 – Large-Scale Temporal Design

As discussed during Chapter One, a primary concern at the commencement of this portfolio was the exploration of rhythmic processes to guide both large-scale and local design, as well as the significance of the perception of these processes. The following chapter focuses on my investigation of the rhythmic techniques of metric modulation and long-range polyrhythms with particular inspiration taken from the structural ideas in Elliott Carter's string quartets, specifically his String Quartets Nos. 2 and 4. Two original pieces also for string quartet, *Juncture* and *Nexus*, served as a preliminary investigatory exercise of these techniques and illustrate my employment of them. In this chapter, I analyse and critique these pieces to explore these ideas and my conclusions regarding them. I also consider the effect in which these explorations have contributed in the subsequent work *Slowly Tilting, Sinking* for solo piano.

Metric Modulations in *Juncture*

Juncture, composed for string quartet, explores the perception of a groove by means of separating the regularly occurring pattern from its traditional notated metre. Metric modulations, which allow the rate of the groove to remain precisely constant through notated tempo changes, are vital to the overall structure of the composition. The piece is influenced by Elliott Carter's String Quartet No. 2 in which the second violin serves as timekeeper, never straying from a pulse stream of MM=140 throughout the duration of the piece, despite formal changes in tempo.

Illustrating an important shift in Carter's rhythmic practice, his String Quartet No. 2 demonstrates his move toward creating a more clarified temporal space and

ultimate journey toward long-range polyrhythmic structures.[34] Treating each instrument as a unique personality embodied by characteristic intervals and rhythms, Carter demonstrates his multilayered rhythmic organisation commonly considered to result in a non-metric quality in which the notated metre is not functional. Although the quartet defies a hierarchical beat structure, the notion of metre is important in understanding the temporal strategy of the piece. The rhythmic organisation of the quartet is based on local and large-scale temporal processes that arise from the coordination of and interaction among individual layers with notated metres serving as significant referential metric areas and as focal points of these processes.[35] Carter's aim to encourage the independence of lines seems to be paradoxical to my incorporation of a groove typically created by a small group of musicians working together, each contributing parts to a composite whole dependent on a functional metre. However, throughout his String Quartet No. 2, discrete sections of the work are defined by the specific manner in which the layered textures, polyrhythmic patterns, and notated metre function and interact. Composite rhythms among the instruments are used by Carter to bring forth the notated metre at moments of culmination or departure, which act as points of initiation or resolution for temporal processes.[36]

For example, the opening (bars 35-57) and concluding sections (bars 75-87) in the first part of the first movement have a stronger reference to the notated metre, whereas in the middle section (bars 60-74), lead by the metric modulation in bars 57-59, multilayered organization prevails. Tiina Koivisto's exploration of the role of metre and notated metre in the multilayered rhythmic organization of Carter's quartet details

[34] Tiina Koivisto, 'Multilayered Rhythms, Meter, and Notated Meter: Temporal Processes in Elliott Carter's Second String Quartet', *Theory and Practice*, 34 (2009), 141-71 (p. 144).
[35] Ibid., p. 163.
[36] Ibid., pp. 145-6.

how the overall rhythmic characteristics and the multilayered organization grow out of the communication among the instruments:[37]

> 'In the opening section, where the layers synchronize with the notated meter, the first violin dominates, announcing a joyful virtuoso character with rapid figurations; the other instruments form a rather stable contrapuntal background with occasional imitations of the first violin's lines. In this counterpoint, the subdivision types serve as powerful tools to present the characters of the instruments. In the multilayered middle section, the zealous cello challenges the first violin with its accelerating lines, and the first violin recedes to less vigorous figurations. This layered texture is formed by the dialogue between the cello and the first violin; it is no longer the beat divisions but the other rhythmic characteristics of the instruments that differentiate the instrumental lines. The opening and middle sections are, nevertheless, connected by their culminations: toward the end of both sections the instruments form a *crescendo* that leads to *fortissimo* chords'.[38]

In its own way, *Juncture* shares Carter's temporal goal of moments of culmination of individual lines and notated metre. Throughout my quartet, all players pass around a pizzicato 'dance-like' figure with the large-scale aim of convergence into the same groove. This figure, referred to as the groove pulse, is based on a samba dance rhythm whose accents originate from the habanera rhythm, defining many Latin dances in simple duple metre. Resulting in new rhythmic ratios, the juxtaposition of the groove pulse and the recurring motif imitated between voices is heard with each tempo change. This imitative motif, or subject motif, establishes the compositional process of fugue as another significant influence. Serving as a referential marker for the formal tempo, the repetition of the same motif throughout the composition aids in the perception of the temporal processes at work.

Juncture begins with all of the players sharing a common pulse; however, changes in metre are incorporated to weaken the regularity of metrical accents from the

[37] See Ibid., p. 146-154 for Koivisto's detailed analysis of the first part of the opening movement.
[38] Ibid., p. 148.

outset. The viola is the first to state the imitative subject motif, while a composite of the pizzicato figures in the other players creates the groove. The first iteration of the subject motif in the second violin marks a shift to compound time, and the pizzicato groove is moved to a single instrument (the viola) in bar 3. Although the semiquaver is constant, different beat levels are stressed with transitions between simple and compound metre. These bars also serve to shift the groove pulse by a semiquaver, so that the accents of the groove do not align with the notated metre. An important arrival occurs at bar 15 in which the groove pulse and notated metre realign. This alignment of groove pulse and notated metre is short lived as the first metric modulation immediately follows.

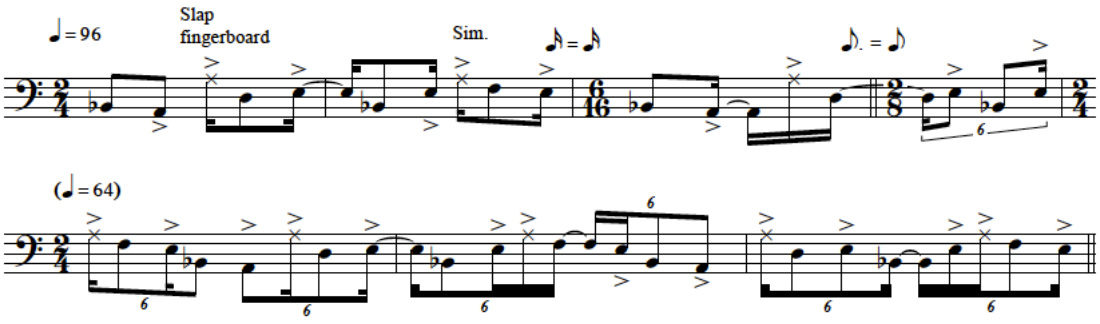
Example 2.1a shows the first tempo modulation (in a 2:3 ratio MM=96 →MM= 64) of the piece beginning in bar 17 in which the groove pulse continues at the audible speed of MM=96, now notated as semiquaver sextuplets, while the overall tempo of the piece drops to MM=64. The viola presents the subject motif in the first bar of the new tempo against the unchanged rate of the groove in the second violin. This new tempo also functions like a new key in the development of a fugue, as the instruments each follow with statements of the subject in the new tempo.

From bar 29 the subject motif and dance rhythm material are more freely explored as the rate of the groove pulse influences all of the instruments at times. The episodic material from bar 29 returns in bar 89 serving as a structural signifier and bookend of this developmental section.[39] At bar 92 the groove pulse disappears during the cello solo helping to facilitate the second metric modulation of the piece (in a 4:5

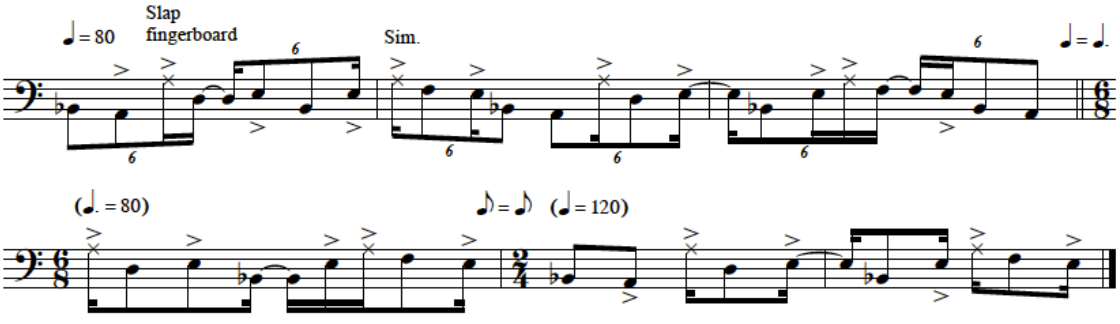
[39] Here I borrow terms associated with the baroque fugue genre, as they were important associations during the composition of the piece; however, I do not mean to assert that *Juncture* wholly conforms to the genre. My use of the term 'developmental section' refers to the development of the subject following its statement in all voices at the original tempo. By 'structural signifier' I mean that the material at bar 92 functions similarly to an episode to connect the end of the development and the cello solo.

ratio MM=64 → MM=80). This metric modulation sets up a kind of recapitulation of the opening material with the groove pulse and notated metre once again aligned. In bar 109 the groove pulse in the second violin suddenly departs from the MM=80 tempo, now proceeding at the audible speed of MM=120.

Another significant tempo modulation is outlined in Example 2.1b (in a 3:2 ratio MM=80→MM=120) in which the notated tempo catches up to the audible speed of the groove pulse beginning in bar 118. A significant unison occurs in bar 139, as all of the players align into the steady traditional samba-inspired groove. This convergence is short-lived as well, as the hierarchy of beats is subverted by the addition of 7/16 bars to create hiccups in the groove to maintain interest until the piece's conclusion.



Example 2.1a: *Juncture,* Metric Modulation 1 Plan



Example 2.1b: *Juncture,* Metric Modulation 3 Plan

Practical Considerations in *Juncture*

Practical considerations are a defining aspect of *Juncture* to aid in the perception of its temporal processes as well as playability. Unlike Carter's assignment of one characteristic rhythm to each instrument for the entirety of the piece, the groove pulse is passed between instruments to avoid monotony for one player due to the literal repetitive nature of the groove pulse. When and to which instrument the groove is passed also required practical considerations to support the most seamless transition. The tempo map shown in Figure 2.1 was an essential part of the preplanning stages of the piece to aid the practicality of performance as well. Each tempo is a whole integer and a familiar tempo marking already internalised by the performers due to their fluency in standard classical repertoire. At times the dense and homogenous texture blurs distinctions of foreground and background. This effect allows the listener to consider different possibilities of the hierarchical function of each pulse stream. Its distinctive timbral quality also aids the perception of the groove pulse through the use of pizzicato and percussive sounds produced by slapping the fingerboard. *Juncture* was recorded in a workshop at Cardiff University with the Carducci Quartet in December of 2015.

Bars 1-18	Bars 19-91	Bars 92-98	Bars 99-109	Bars 109 - 118	Bars 119-171(end)
Tempo ♩ = 96	Tempo ♩ = 64	Tempo ♩ = 64	Tempo ♩ = 80	Tempo ♩ = 80	Tempo ♩ = 120
Groove speed ♩ = 96	Groove speed ♩ = 96	Cello solo	Groove speed ♩ = 80	Groove speed ♩ = 120	Groove speed ♩ = 120

Figure 2.1: *Juncture,* Tempo Map

Long-Range Polyrhythm in *Nexus*

Another temporal structure used by Elliott Carter is adopted in *Nexus*, which incorporates a long-range polyrhythm, the roots of which can be found in earlier compositions where Carter deliberately combined different simultaneous speeds not only at the musical surface but also at a deeper, structural level.[40] Such polyrhythmic patterns were one logical continuation for the multi-layering techniques, as long-range polyrhythms were a way to clarify the relations among rhythmic layers, to regulate beat divisions in these layers, and to place these aspects within a global plan provided by the polyrhythmic pattern.[41]

The rhythmic strategies used in spaces that employ long-range polyrhythms are similar to the strategies in the previously discussed String Quartet No. 2 in the way Carter coordinates rhythmic layers, building up processes that create large-scale and local rhythmic tensions and their resolutions. In his String Quartet No. 2, these resolutions often occur with the synchronisation of pulse speeds with the notated metre, while synchronisation often involves the coincidence points of the polyrhythmic patterns in the long-range polyrhythmic practice. In both practices Carter deploys these temporal processes to emphasise the structure of the work, creating goals and resolutions at key structural moments.[42]

[40] Long-range polyrhythms, or structural polyrhythms as Coulembier prefers to call them, appear in almost every composition Carter wrote during the 1980s; however, the roots of this technique can be found as early as 1961 in his Double Concerto and Concerto for Orchestra (1969) with *A Mirror on which to dwell* (1975) being the first instance of its use as a structuring and form-generating feature. See Klaas Coulembier, 'Elliott Carter's Structural Polyrhythms in the 1970s: 'A Mirror on Which to Dwell', *Tempo,* 261 (July 2012), 12-25 (p. 12).

[41] Link, p. 34.

[42] Tiina Koivisto, p. 144.

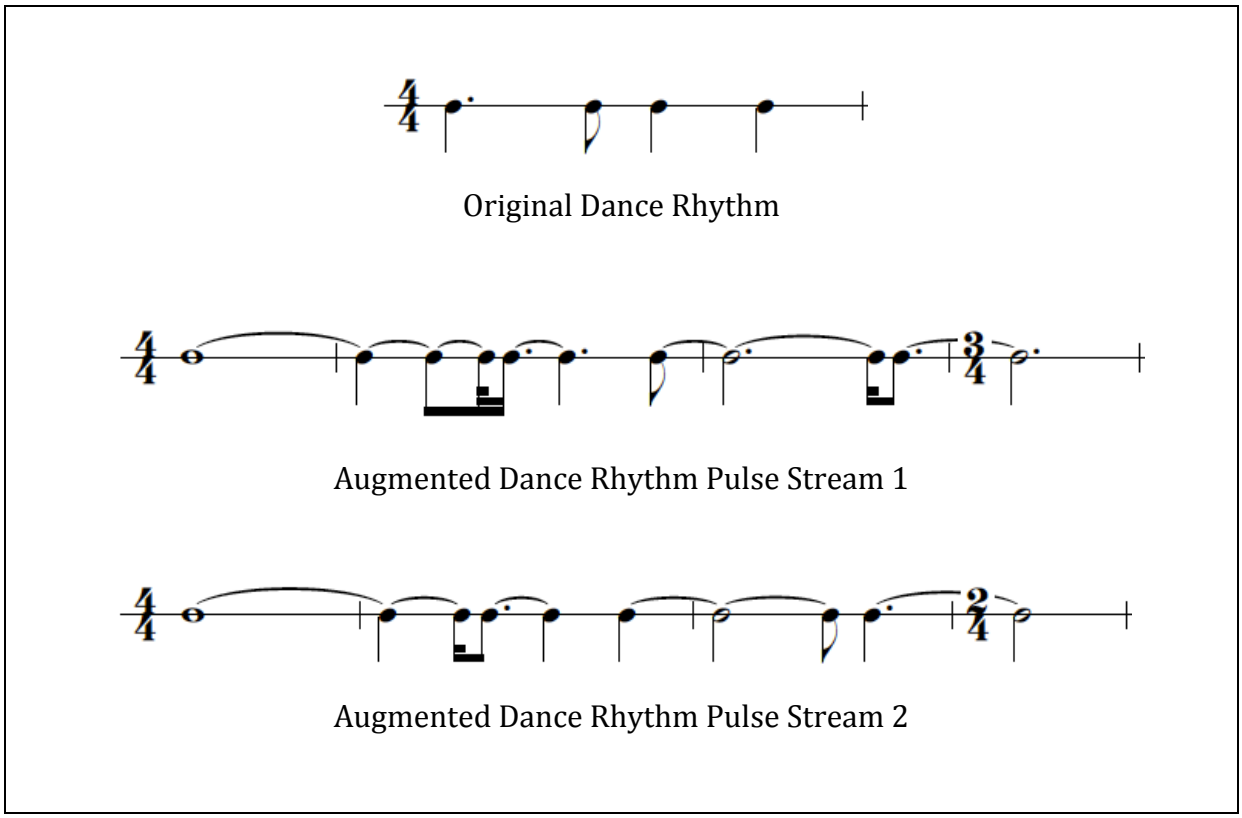
Long-range polyrhythms also serve to facilitate Carter's expressive effort to combine different strands of music that have different characters.[43] In his programme note to String Quartet No. 4, Carter writes of wanting the music to mirror 'the democratic attitude in which each member of a society maintains his or her own identity while cooperating in a common effort…,' and that 'more than in others of my scores, a spirit of cooperation prevails.' The common effort that Carter mentions is reflected in the piece in the many shared gestures as well as Carter's choice of a polyrhythm with partial coincidence points.[44]

Nexus shares similar expressive concerns as moments of brief alignment between pairs or trios, partial coincidence points of the long-range polyrhythm, are celebrated alongside the individuality of each line throughout the single movement. The polyrhythm of *Nexus* has four pulse streams, each typically present in one instrument at a time throughout. The duration of the piece equals exactly one polyrhythmic cycle with all four pulse streams in alignment at a coincidence point only at the very beginning and end. Pulse Stream 1 pulsations occur every 15 beats with Pulse Streams 2-4 occurring every 14, 6 2/3, and 8 2/5 beats respectively. This large-scale polyrhythm serves as the background scaffolding of the piece with each pulsation marked by a dynamic swell.

Polyrhythms also function on other structural levels. In the middle ground, augmented dance rhythms, as seen in Example 2.2, repeat with each of the long-range polyrhythm's pulsations to create overlapping phrases of unequal lengths in Pulse Streams 1 and 2. Additionally, each instance of alignment of pulse streams is highlighted throughout by a foreground rhythmic motif, which is used for pulsations

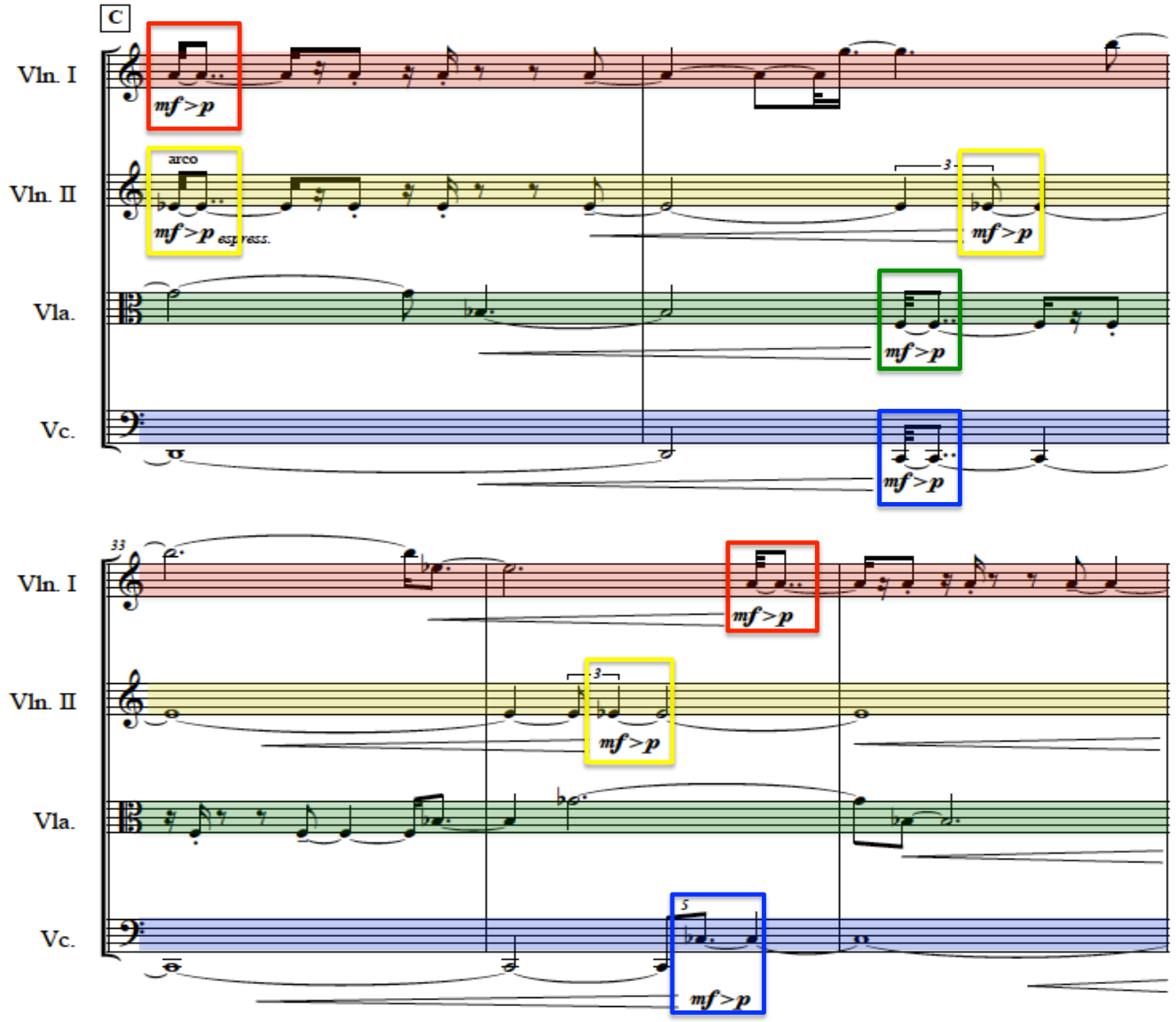
[43] Link, p. 34.
[44] Ibid., pp. 55-56.

that align with beats of the notated metre. The use of this foreground rhythmic motif and its accentuation of partial points of coincidence can be seen initially in the first bar of Example 2.3 in the violins which briefly share the same rhythm. The entire example illustrates the processes mentioned from rehearsal letter C of the score with each pulse stream highlighted in a different colour and all of the long-range pulsations squared.

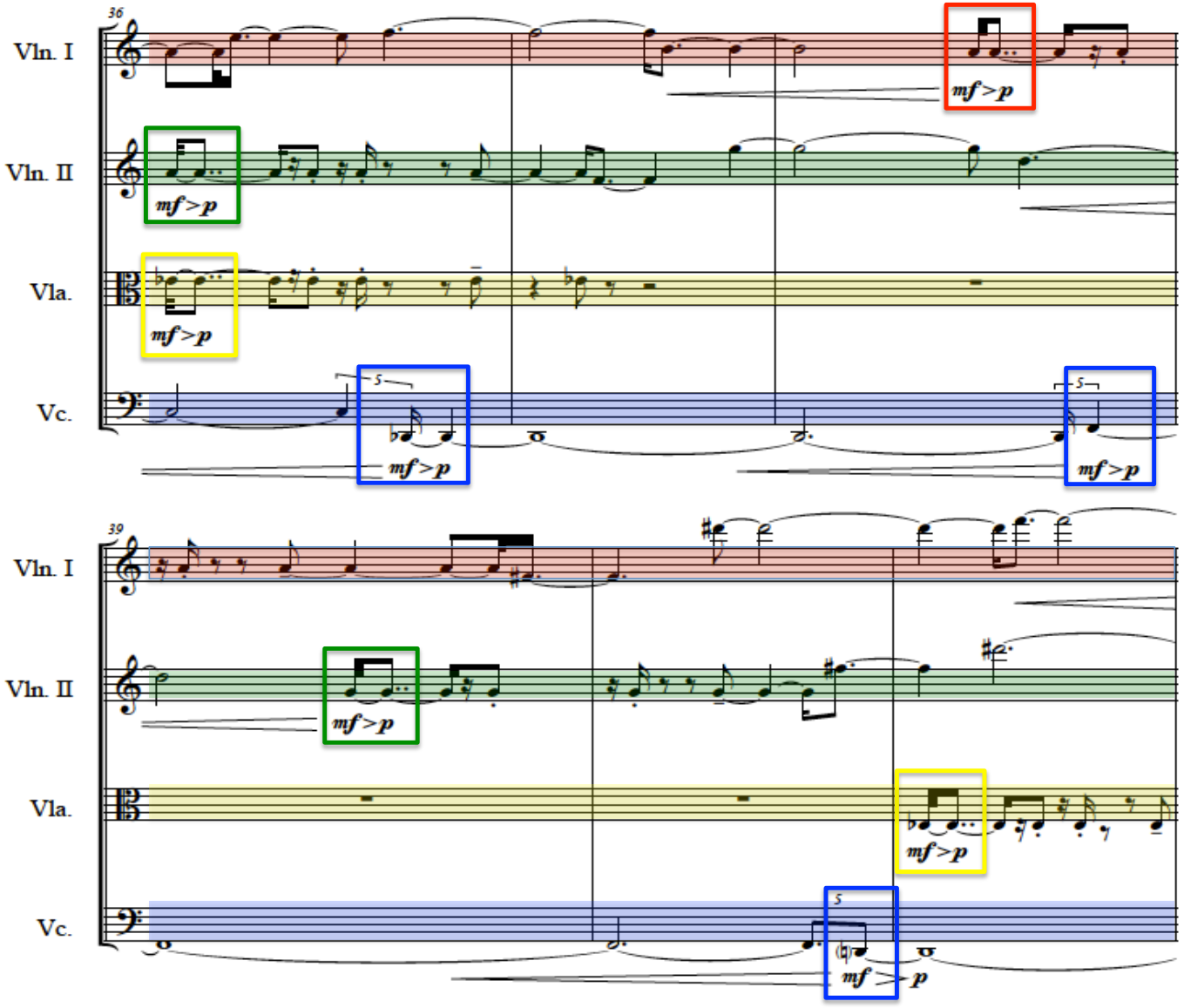


Example 2.2: *Nexus,* Phrase Level Polyrhythm

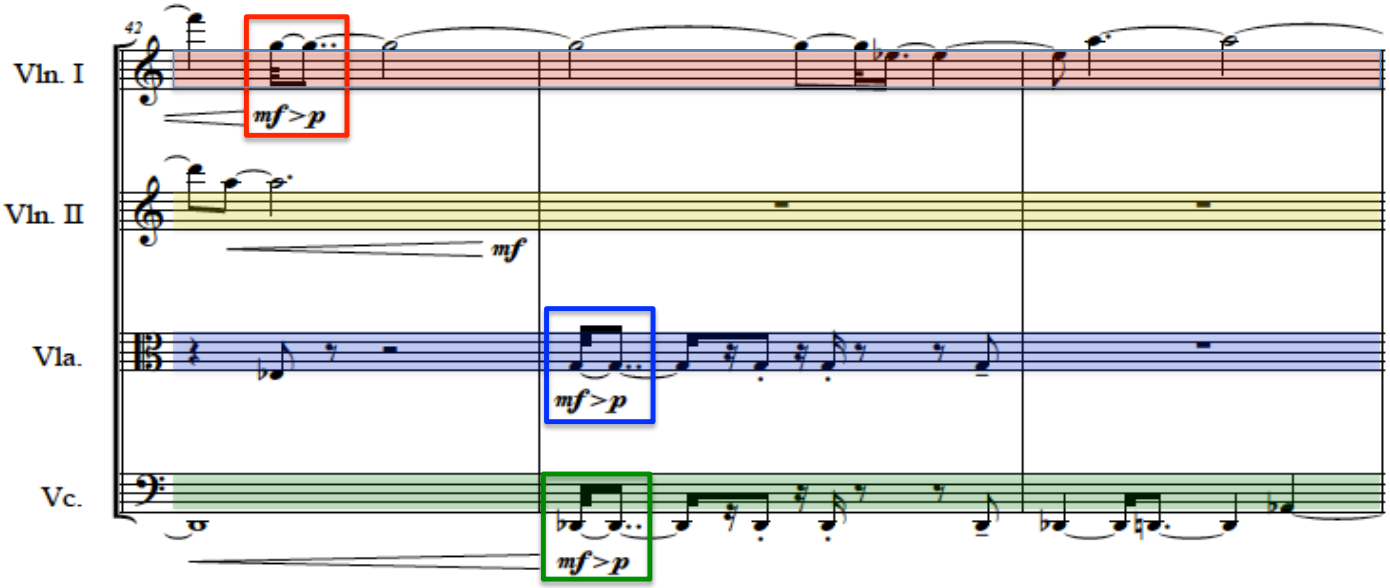
Pulse Stream 1
Pulse Stream 2
Pulse Stream 3
Pulse Stream 4



Example 2.3: *Nexus,* Interaction of Pulse Streams from Rehearsal Letter C



Example 2.3 Continued



Example 2.3 Continued

Practical Considerations in *Nexus*

Once again practical considerations are necessary to establish the perception of the temporal processes at work, as well as contribute to playability. The long-range polyrhythm and its coordinating pulse streams were considered carefully based on the resulting fraction's appropriateness for standard rhythmic notation with a quintuplet being the most complicated tuplet utilised. Similarly to the groove pulse in *Juncture*, each member of the quartet is not bound to one pulse stream. Instead, the pulse streams are passed around each member of the ensemble, although each instrument is most associated with its opening pulse stream. The exception to this general rule is the coordination of the second violin and viola to form Pulse Stream 3 at the beginning of the piece. The decision to omit the quintuplet-based Pulse Stream 4 in this opening section was to avoid awkward near-coincidence points between Pulse Streams 3 and 4, which sounded more like mistakes within the seemingly pointillistic pizzicato opening than conflicting pulse streams. The reason for this is the slow speed of the long-range pulsations presents a significant obstacle to perceptibility. The pulsations of Pulse Stream 4 receive more prominence beginning in bar 22 in the cello, as the repetition at the phrase level aids the perception of the conflicting pulse streams in this section. The repeating dance rhythms help the listener perceive the long-range process as phrases become more and less in phase as a result of near coincidence points and points of maximum divergence throughout the structural polyrhythmic cycle. The distribution of pulse streams between the instruments for the entire piece is shown in Figure 2.2.

Pulse Stream 1: every 15 beats or MM=21.33

Bar Numbers	Instrument
1-60	Violin I
61-75	Violin II
76-90	Violin I
91-end	Violin II

Pulse Stream 2: every 14 beats or MM=22.86

Bars Numbers	Instrument	Bar Numbers	Instrument
1-21	Cello	71-74, beat 2	Viola
22-35	Viola	74, beat 3-77	Cello
36-42	Violin II	78-84	Viola
43-49	Cello	85-91	Cello
50-53, beat 2	Viola	92-95, beat 2	Viola
53, beat 3 - 56	Cello	95, beat 3-98	Cello
57-63	Viola	99-end	Viola
64-70	Cello		

Pulse Stream 3: every 6 2/3 beats or MM=48

Bar Numbers	Instruments
1-21	Violin II & Viola
22-35	Violin II
36-42	Viola
43-60	Violin II
61-75	Violin I
76-90	Violin II
91-end	Violin I

Pulse Stream 4: every 8 2/5 beats or MM=38.1

Bar Numbers	Instruments
1	Viola
11	Viola
22-42	Cello
43	Viola
53, beat 3	Viola
64	Viola
74, beat 3	Viola
85	Viola
95, beat 3	Viola
99, beat 3-end	Cello

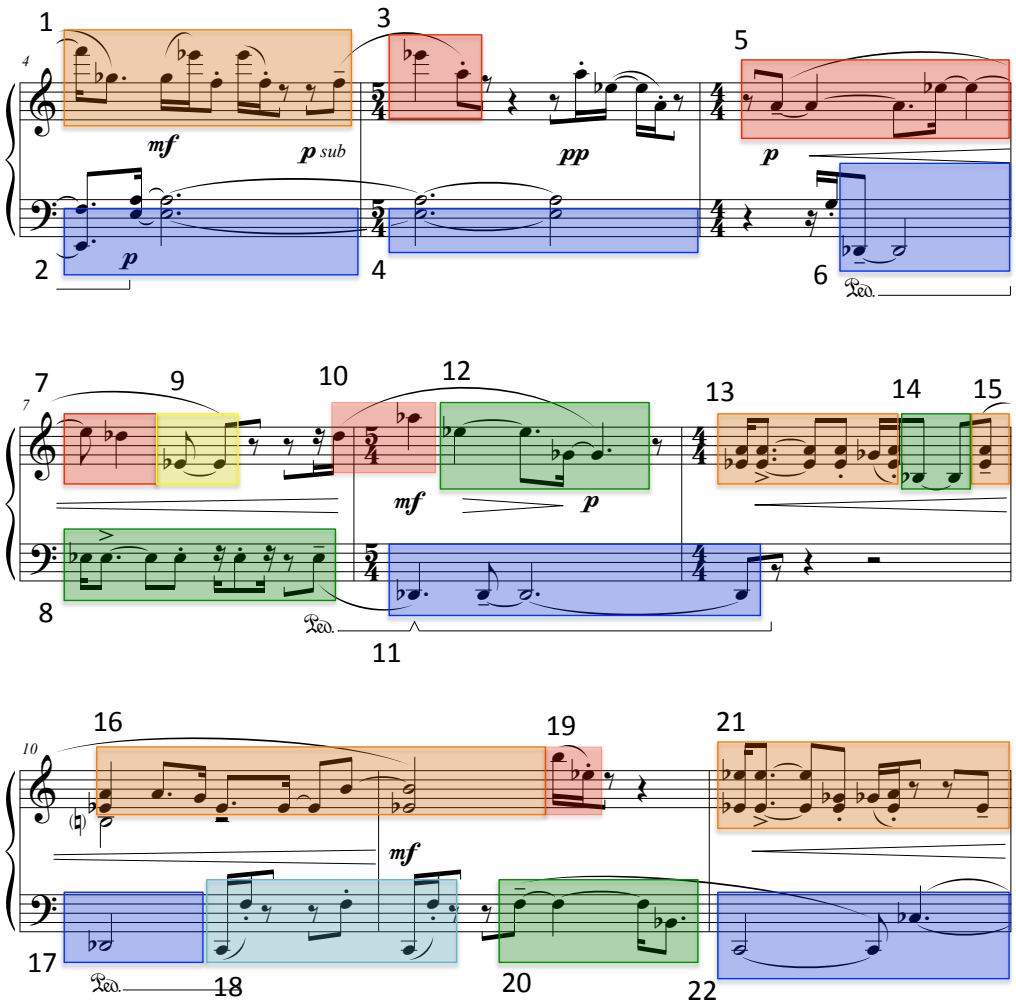
Figure 2.2: *Nexus*, Pulse Stream Distribution Table

Function of Long-Range Polyrhythms as a Generator of Material

Nexus is one of the most rhythmically systematic pieces of the portfolio. While there is some freedom of manipulation of foreground material, the initiated processes are upheld fairly strictly throughout the duration of the piece in this initial exploration. Cells which originate rather out of consequence of the rules established in *Nexus* are developed further without such strict constraint in the later piece *Slowly Tilting, Sinking* for solo piano. The functional possibility of long-range polyrhythms as a generator of material for more localised development was an important discovery during the extent of my research. In addition to their effectiveness at establishing long-range temporal structures, long-range polyrhythms can provide initial material when it is not possible to wait for divine inspiration to strike.

Long-Range Polyrhythm in *Slowly Tilting, Sinking*

Slowly Tilting, Sinking borrows the structural polyrhythm from *Nexus*, which is then freely clipped and expanded, isolating cells for further development. Examples 2.4a and 2.4b provide a side-by-side comparison of the use of a portion of the long-range polyrhythm in *Nexus* and its reduction in *Slowly Tilting, Sinking*. While segments of the original polyrhythm are slightly altered or omitted in *Slowly Tilting, Sinking*, as detailed in Example 2.4a, the connection between *Nexus* and the piano solo are undeniable. A principal concern of the treatment of the long-range polyrhythm in the piano solo is no longer the perceptibility of individual pulse streams, as was the case in *Nexus*. The polyrhythm in *Slowly Tilting, Sinking* becomes less visible in the score as it is intuitively manipulated and even omitted for entire sections.



Example 2.4a: *Slowly Tilting, Sinking* bars 4-12

1. Vln. I + II, *Nexus* bar 26

2. Vc., *Nexus* bar 26, first beat rhythm simplified and octave displacement of repeated F-flat/E

3. Vln. I, *Nexus* bar 27

4. Vc., *Nexus* bar 27, sustain augmented by 1 beat

5. Vln. I, *Nexus* bar 28, third beat rhythm simplified

6. Vc., *Nexus* bar 28, slightly delayed entry of D-flat

7. Vln. I, *Nexus* bar 29

8. Vla., *Nexus* bar 29

9. Vln. II, *Nexus* bar 29 anticipated and rhythmically augmented

10. Vln. I, *Nexus* bars 29 & 30, anticipated entry of G-sharp/A-flat

11. Vc., Nexus bar 30, second beat rhythm simplified and sustain augmented by 1 beat

12. Vla., Nexus bar 30, slightly anticipated entry and octave displacement of G-flat

13. Vln I + II, *Nexus* bar 31

14. Vla., *Nexus* bar 31

15. Vln. I + II, *Nexus* bar 31, second half of last beat

16. Vln. I + II, *Nexus* bar 32 & first two beats of bar 33, rhythms simplified and octave displacement of G and B

17. Vc. *Nexus* bar 32, first two beats

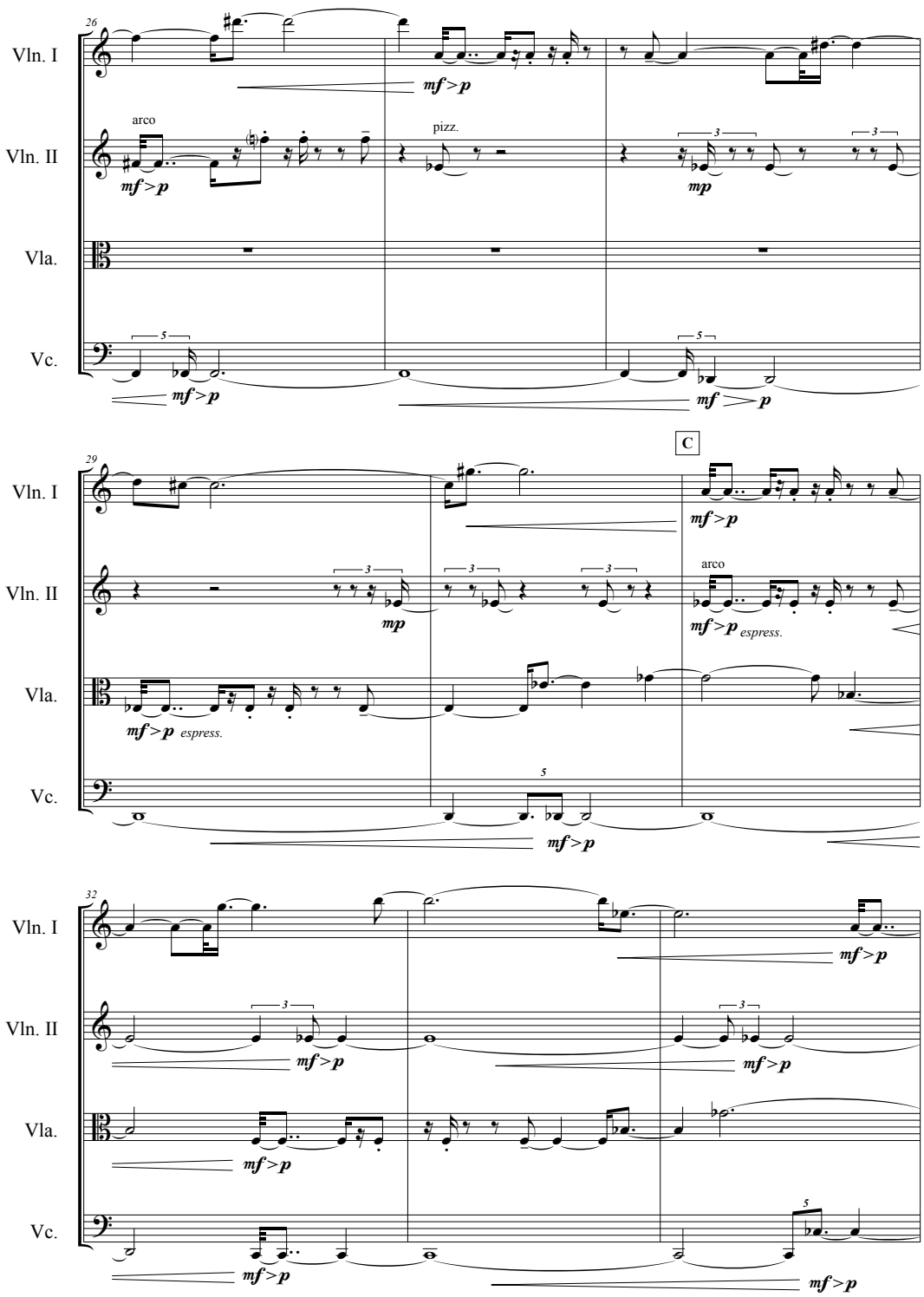
18. Vc. + Vla. *Nexus* bar 32, beats 3 & 4, and bar 33, beat 1

19. Vln. I, *Nexus* bar 33, E-flat anticipated

20. Vla., *Nexus* bar 33, last three beats, octave displacement of B-flat

21. Vln. I + II, *Nexus* bar 34, rhythm altered to match bar 31

22. Vc., *Nexus* bar 34, rhythm simplified



Example 2.4b: *Nexus* bars 26-34

In bar 16 of *Slowly Tilting, Sinking*, previously heard cells are layered over the long-range polyrhythm as the right-hand material from bars 4 and 5 is repeated against

the first beat of the right hand in bar 14 at a lower octave. From the tempo change in bar 32, these cells are combined, repeated and manipulated further to halt or generate momentum in a flexible process until the transition to the next formal section. Forward energy is halted by means of the sustained D-flat in bar 35 before the material from the previous two bars repeats, as if a machine stuck and started again. This time, however, the pattern does not begin at the beginning of the beat as a means of gradual transformation to provide interest. There are additional 'false starts' to the machine. For example, the return of the *sforzando* chord in bar 39 suggests a repetition of the material from bars 24-26; however, the previously introduced cells from bar 16 embed themselves in bar 41 as well. Until bar 48, momentum is further generated through additional shifting syncopations which realign the right and left-hand cells from bar 16, along with the driving pulsation of shorter note values and expansion of register.

At this point in the piece, it is evident I agree with Birtwistle's view toward faithfulness to processes:

> 'The decisions about where to go derive from the context of where you are at any moment. It's important for me that it's not preformed: I get very uninterested in just sticking to a process - the creative juices are in abeyance! When the piece takes over, and I have to go with it, that's when I feel good about it. But if I hadn't stayed with a very formal approach, I wouldn't have arrived at that point'.[45]

The free manipulation of the initial long-range polyrhythm in *Slowly Tilting, Sinking* allowed the creation of a piece more aligned with how I intuitively compose, often developing ideas nonsequentially before fitting them together. The long-range rhythmic scaffolding provides an interesting referential purpose, in this case, which allows for the manipulation of time as the polyrhythm is embedded further into the piece following an intuitively composed middle section.

[45] Birtwistle, p. 16.

Chapter 3 – Extra-Musical Influences on Temporal Structure

In Chapter 2, I discussed procedures used to temporally structure instrumental pieces which were principally inspired by the investigation of the compositional techniques themselves. In this chapter, I now reflect on pieces which respond to extra-musical stimuli in some way with particular consideration for the effect of such impetuses on the structure of a piece. In an interview introducing her *Nature Symphony*, Arlene Sierra discusses her view of extra-musical stimuli:

> 'It's partly my interest in process, and putting extra-musical processes in my music; not narratives, stories or personal impressions so much as just a way to make ideas work amongst rhythms and pitches,' [46]

This chapter illustrates my alignment with Sierra, as extra-musical stimuli generally influence the structural processes of a piece, rather than serve any programmatic function. The exception to this being pieces with texts in which processes are used to facilitate a narrative. My investigation of the relevant works begins with the vocal piece *Shadow Woman*, which was written in response to a pre-existing poem. Next, the influence of a visual art installation is considered in my analysis of the miniature work *Shift* for flute and harp duo. The chapter closes with an examination of a subsequent piece *Undercurrent,* which expands material initially introduced in the previous composition.

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[46] Katy Wright, 'Premieres: November's new music', *Rhinegold*, (1 November 2017) <www.rhinegold.co.uk/classical_music/premieres-novembers-new-music-2/> [accessed 11 January 2018].

Working with a Pre-existing Poem in *Shadow Woman*

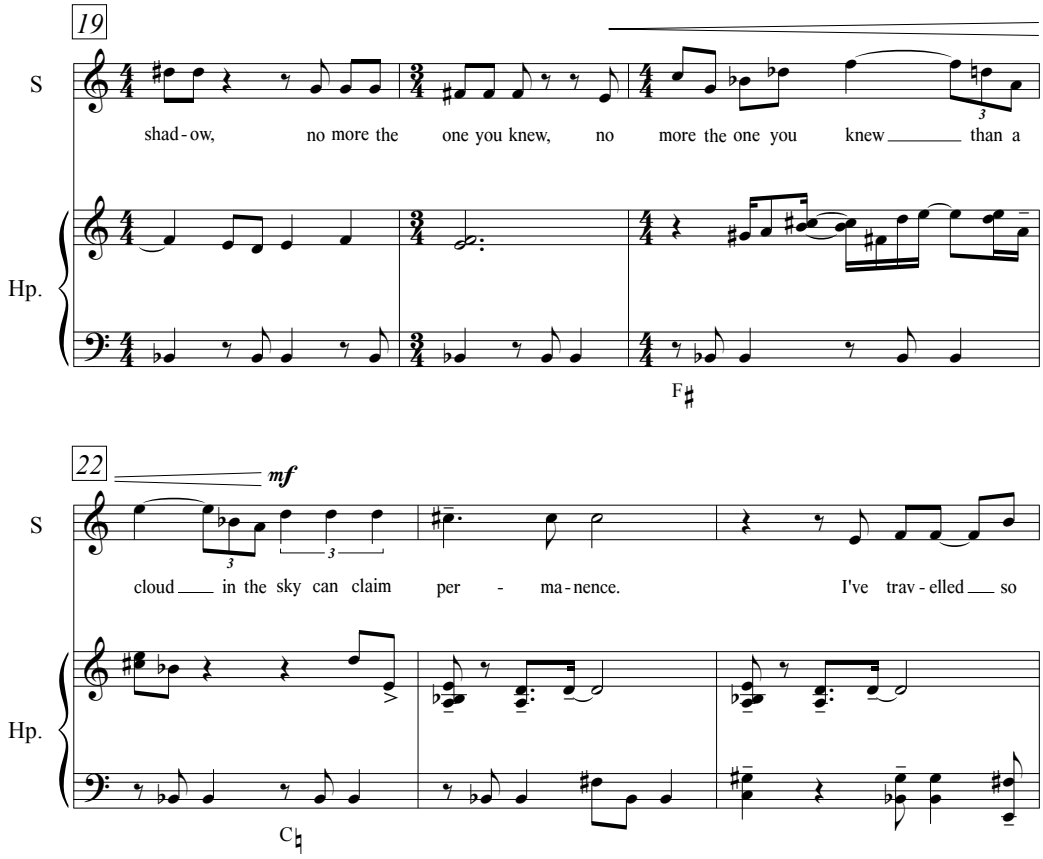
The text for *Shadow Woman* comes from a set of sonnets by James Nash which was written as part of a collaboration with the Cardiff/York Coma and Disorders of Consciousness Research Centre. The centre regularly collaborates with a diverse range of artists to engage people in dialogue with their research via different media. Nash was given access to some of the 50+ anonymised interview transcripts with family members of people in permanent vegetative and minimally conscious states, resulting in the composition of three sonnets looking at aspects of coma from differing points of view.

Being offered the choice of any of the three sonnets, I ultimately chose to set the second, as I was excited to capture the movement encompassed in its powerful imagery in opposition to the narrative of a woman who has become a shadow of herself. The theme of loss of identity, particularly in a first-person account, also closely aligns with the subject of my monodrama, albeit in rather different contexts, which made this sonnet distinctly appropriate for my frame of mind at the time.

Heartbeat Rhythm in *Shadow Woman*

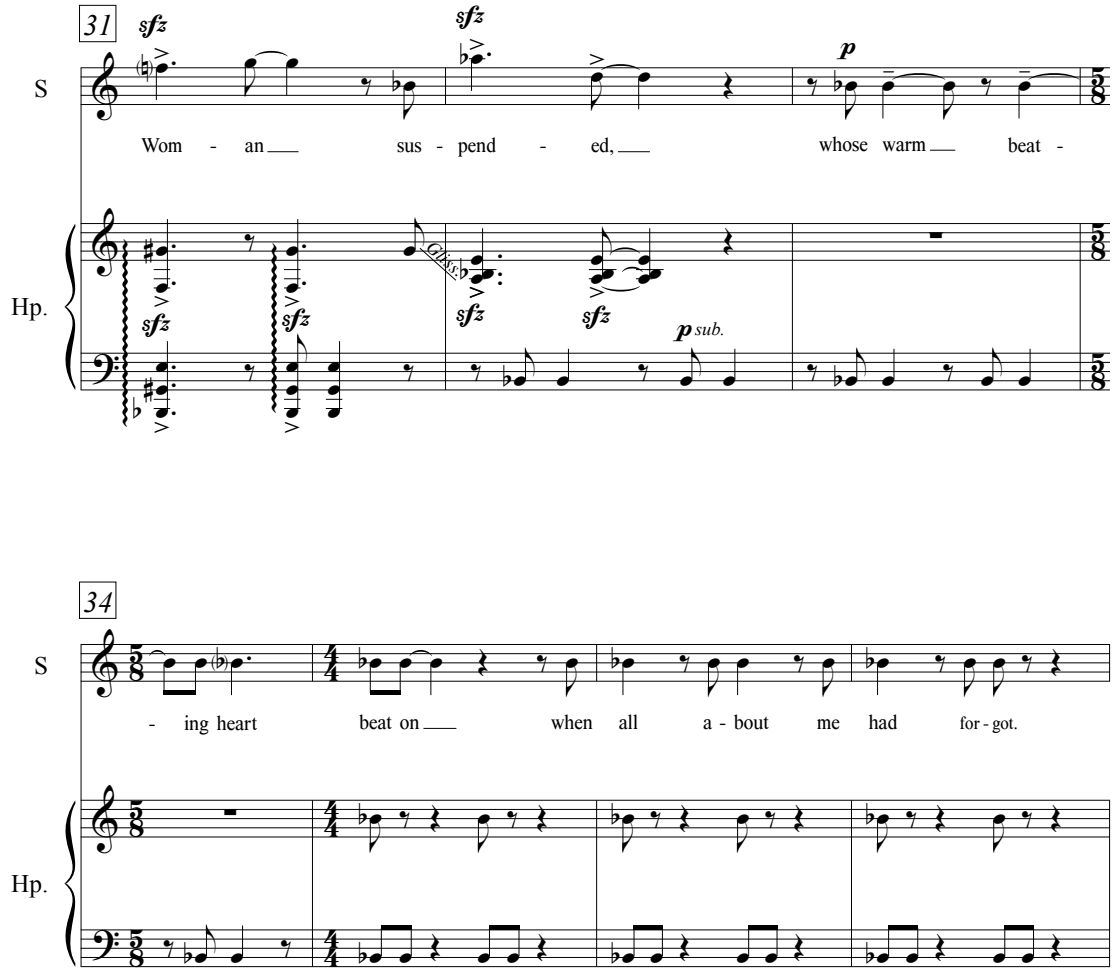
A rhythmic strategy of the piece engages with a 'heartbeat' rhythm, presented in the first bar, which appears throughout the song in different contexts. Rhythmic processes of augmentation and changes of metre are used throughout the piece to clip, shift, or extend this pattern in relation to the text. Example 3.1 illustrates how the metre change in bar 20 functions to shift the heartbeat rhythm by one beat so that it relates differently to the strong beats of the metre, as well as stressed words of the text. In bar 24, the characteristic repeated B-flats of the heartbeat rhythm are also

incorporated into a groove to accompany the narrator's discussion of her journey and evoke the sense of movement encompassed in the lyric. The static harmony negates this sense of movement, however, as a reminder of the contradictory nature of the travel of a woman who is 'suspended'.



Example 3.1: *Shadow Woman*, Shifted 'Heartbeat' Rhythm bars 19-24

The shifted heartbeat rhythm becomes even more mechanical as the narrator acknowledges her bodily condition. As shown in Example 3.2, any sort of expression is stripped away, as a change in metre for bar 34 further shifts the repeated B-flats into a square 4/4 pattern to correspond with the mechanical ticking of her heart depicted in the text.



Example 3.2: *Shadow Woman* bars 31-37

The previously introduced groove from bar 24 returns in bar 52; however, rhythmic augmentation gradually degrades its identity to close the piece. The pervasive rhythm, and essence of the entire piece, suffers the same fate as the narrator; it becomes a shadow of itself.

Responding to Visual Art in *Shift*

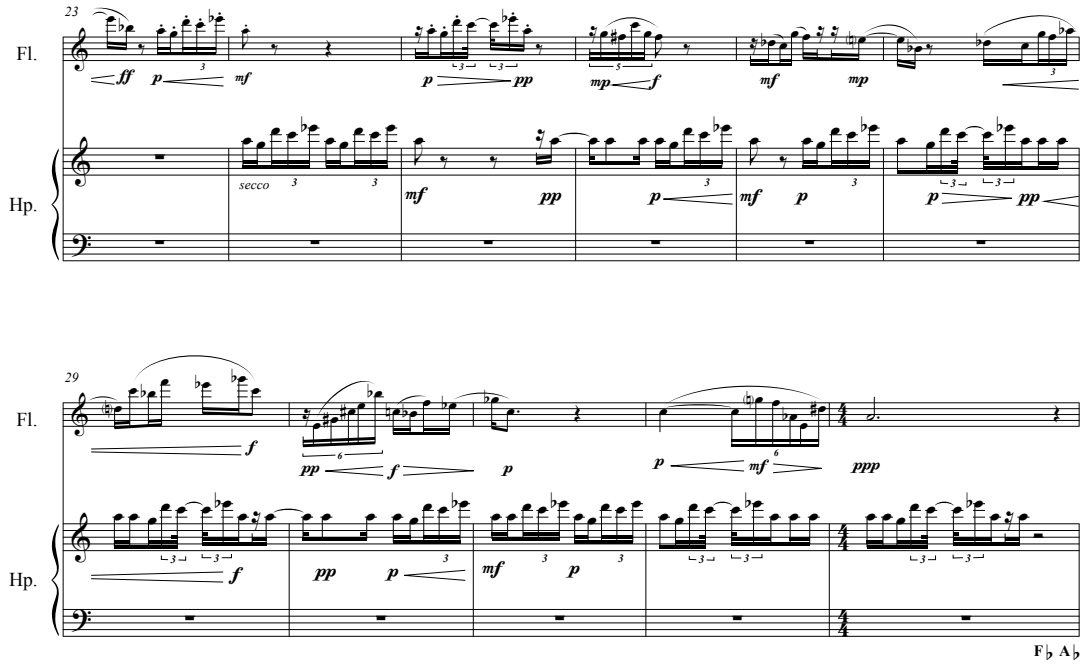
While text governs the rhythmic processes in *Shadow Woman*, temporal strategies in *Shift,* specifically written to be premiered in the gallery alongside its

inspiration, respond to visual art. The piece was written to accompany an installation of the same name by artist Anne Gibbs which was featured in National Museum Cardiff's 'Fragile?' contemporary ceramics exhibition in 2015. Gibbs' work, photos of which are included as Figure 3.1a and 3.1b, incorporates intricate small-scale figures that explore themes of beauty and unrest, approached with sensitivity and precision. Each ceramic figure could be viewed as an independent piece, but what I find striking is Gibbs' deliberate arrangement of these seemingly incongruent figures to form the collection as a whole. Specifically, two aspects of Gibbs' piece have inspired the processes encompassed in its musical companion: its title and combination of disparate materials.

Figure 3.1a: *Shift,* 2015 by Anne Gibbs, National Museum Cardiff *Fragile?* Exhibition

Figure 3.1b: Close-up of Anne Gibbs' delicate figures

The title of Gibbs' piece was instantly intriguing to me in particular, and in a way, it served as an instruction for the composition of the piece. A five-note cell of pitches that is perpetually shifted rhythmically into reoccurring musical figures largely comprises the piece. This set of pitches, initially introduced as semiquaver triplets in the first bar, was isolated from the painstakingly intuitively composed opening flute gesture. Example 3.3 illustrates the treatment of the cell, as it is passed between the instruments before taking on the role of accompaniment in the harp. The pair engages in a dialogue at the beginning of the example, trading turns stating the cell. The flute breaks away in bar 26, and the function of the cell is altered as it continues in the harp creating a sort of high A pedal.



Example 3.3: *Shift* bars 23-33

This example also introduces an approach to combining disparate materials, the second principal source of inspiration taken from Gibbs' ceramic piece. There is a parallel between the visual installation composed of differing materials and the grouping of contrasting instruments in the musical work. *Shift* combines the agile

chromaticism of the flute and the timbral possibilities made available by the differing lengths of the harp's strings to correspond with the mixed materials in Gibb's installation. Returning to Example 3.3, one notices the harp tuning remains constant, while the flute freely explores chromatic lines. The timbre of the instruments further stratifies them as well. The flute begins the passage staccato to correspond to the harp's secco direction; however, as the harmonic palette of the flute is extended, its gestures become legato. Pitch and timbre are explored further as signifiers of contrasting rhythmic processes as part of the discussion of the next piece of the portfolio.

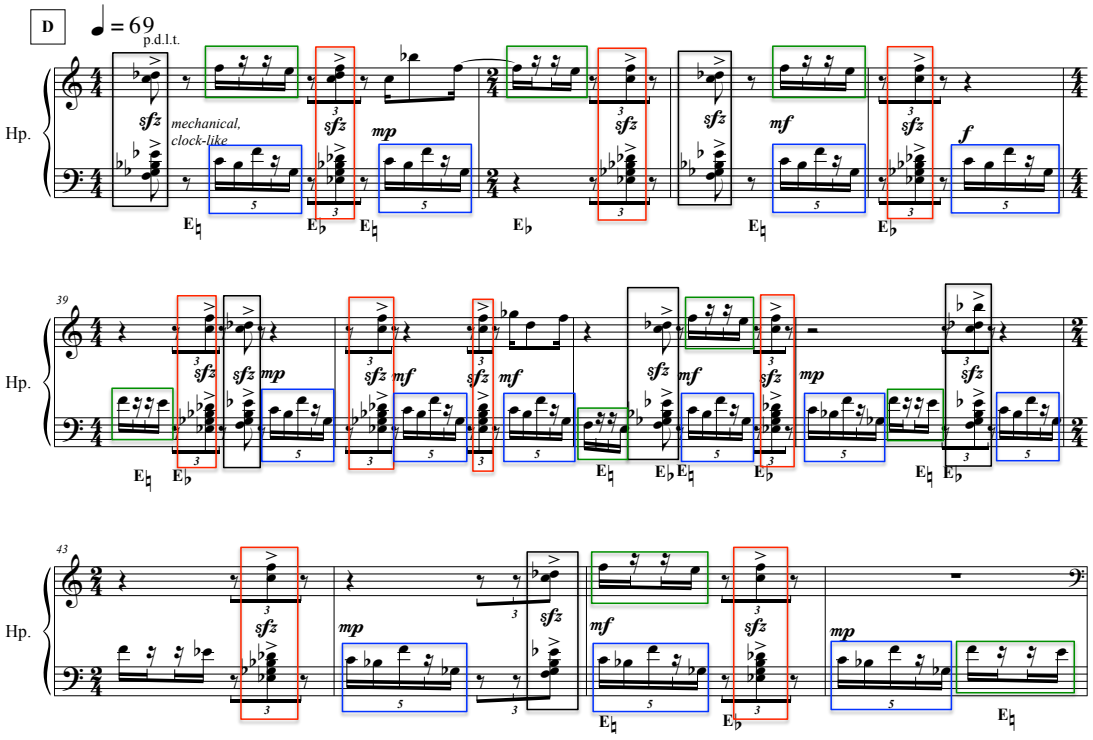
Combining Disparate Materials in *Undercurrent*

Shift was one of the first pieces composed during my PhD research, and as economy of material is another considerable concern, there was more I wanted to unpack from the materials in the flute and harp duo. *Undercurrent* develops ideas from *Shift* within a longer piece, both motivic and constructional, particularly the concept of the arrangement of disparate elements together. Throughout the piece, timbre functions alongside differing approaches to metre and pulse to coordinate or stratify the instrumental characters.

The largely atmospheric opening of *Undercurrent* comprises of dovetailed expressive lines in the flute and viola underpinned by muddled chords in the harp's lower register. This section corresponds to the organic ceramic shapes in Gibbs' installation, which I associate with breath and resonance. A strong pulse is evaded in this section with metre constantly changing to support the expressive lines. In the faster central section of the piece, however, the dense harp chords evolve into secco rhythmic pulsations which provide a mechanical-like current in opposition to the

expressive gestures characteristic of the flute and viola pair. These secco passages on the harp's shorter strings complement Gibbs' figures made of pins and wire.

Four primary cells, each squared in a different colour in Example 3.4, are combined in different ways to construct the harp part in the central section in bars 35-46. At times these cells are repeated in a familiar pattern to encourage a participatory mode of listening, or realise a groove. The first six beats of the groove are immediately repeated, with very slight alteration.[47] However, in bar 40, the third iteration of the pattern is interrupted, and the groove is never stated exactly, although it is implied throughout the rest of the example.



Example 3.4: *Undercurrent*, Harp bars 35-46

The final section of *Undercurrent* is a return to the atmospheric opening as the original harp chords return in bar 73. From bar 79, the viola is no longer paired with

[47] The treble part of the last beat of bar 35 is not repeated in bar 38, and the cell boxed in green is presented at a lower octave in bar 39 from its original occurrence in bar 36.

the flute. With each of the new pair conforming to its own pulse, the timbre of the viola is altered by the sul tasto, non vibrato direction to engage with the repeated rhythm in the harp. Repeating at a differing rate in both instruments, the rhythmic pattern is slowly augmented in the viola until the individual streams converge as illustrated in Example 3.5. Initially one bar in length, the viola pattern is augmented to last for two bars beginning in bar 85. The final augmentation joins the pulse streams of both instruments in the last three bars to close the piece.

Example 3.5: *Undercurrent* bars 79-end

Chapter 4 – Systematic Approaches to Harmony

As the primary focus of my research was to do with rhythm as a controller of structure, harmonic practices have been of lesser emphasis with regards to my research aims and generally have not been treated as an independent feature of primary concern. However, it would be remiss to omit any extended examination of harmonic structures when discussing my compositional practice, particularly concerning how pitch relates to the perception of treatments of time. Favouring a more intuitive approach to harmony, I find myself less satisfied with pieces which are too tightly controlled in terms of pitch; however, systematic uses of pitch do appear, although they are usually confined by some of the defining characteristics of my intuitive use of harmony including establishing a fundamental pitch centre and the use of characteristic intervals.[48] This chapter will explore my application of polymodal chromaticism in the open score piece *Convergence* for flexible quartet, before proceeding on to a discussion of the handling of the serial rotation technique in *Up and Down and Sideways* for mixed ensemble.

Polymodal Chromaticism in *Convergence*

Convergence was written after initial observations of the Emulsion Quartet as part of Cheltenham Music Festival's Composers' Academy in 2015. Allowed only a short workshop with the mixed quartet, I decided to explore a single concept that could be presented in a short amount of time. While taking into consideration the strengths of

[48] The intervals of a major second, minor third, tritone, perfect fifth, and major seventh feature heavily, linearly as well as vertically throughout my intuitive use of pitch. The pieces discussed in this chapter are similarly defined by the use of these intervals, specifically the intervals of a perfect fifth and minor third, which are significant in regard to pitch centre relationships and prominent intervals within a tone row.

the ensemble including an explicit understanding of indeterminacy and improvisation, I decided on an open score concept involving the juxtaposition of modes with a common fundamental pitch. This piece explores superimposed modes in a similar way in which conflicting pulse streams are handled in *Juncture*. The project is a procedural exploration of intervallic contraction.

The structure of *Convergence* is inspired by the harmonic concept of polymodal chromaticism, discussed by Béla Bartók in the so-called Harvard Lectures of 1943, in which, unlike polytonality that by definition has multiple key centres, only one fundamental pitch is present. By combining the modes of Phrygian and Lydian with a common fundamental tone, the resulting pitch set makes available all twelve chromatic notes for use without the functional implications associated with chromaticism in the tonal sense of late-Romanticism. Bartók held that this harmonic structure was an ideal extension of tonality in that with polymodal chromaticism there is still an evident pitch centre, yet each of the chromatic notes can be used freely as part of a diatonic modal scale.[49] While I am less pressured to justify treatments of chromatic harmony given current philosophies, I find this technique interesting for its potential to be incorporated into structural processes.

While any flexible quartet can play *Convergence*, I will refer to the instrumentation of the Emulsion Quartet with oboe, violin, tenor saxophone, and double bass on parts 1-4 respectively.[50] The juxtaposition of modes is seen at the beginning of the piece; the violin plays the defining pitches of the C Phrygian mode exclusively, while the oboe plays the pitches which define C Lydian. Concurrently, the double bass sustains the note C to establish the pitch centre, while the saxophone improvises on the

[49] Béla Bartók, 'Harvard Lectures', in *Béla Bartók Essays*, ed. Benjamin Suchoff (London: Faber, 1976), 354-92 (p. 367).

[50] This instrumentation corresponds to the recording included as track 7 on the supplementary CD to the scores included in the first volume of the thesis.

Phrygian scale. This design remains consistent through transpositions to new pitch centres every thirty seconds with the role of each instrument alternating between sustaining the fundamental, improvising with a supplied set of pitches, or improvising a modal solo to establish juxtapositions of other modes against the Lydian scale. As outlined in Figure 4.1, the number of common tones between the two modes in use increases by one with each transposition, suggesting an overall progression toward the Lydian mode. The transpositions to new pitch centres follow the Circle of Fifths in reference to the two common tones between the two original superimposed modes, Phrygian and Lydian, which are a perfect fifth apart.

The title of the piece mirrors its process in that the instrumental forces slowly converge into a shared mode. Throughout the piece, the pitch centre of all of the instruments is also always common, and the mode of Lydian is always an underlying presence; whereas, in the foreground, individual instruments may be playing exclusively in contrasting modes. The mixture of these modes ultimately serves to colour the structurally fundamental Lydian scale.

As a composer who is generally less satisfied composing with indeterminate elements, I found this piece an interesting initial investigation into a harmonic process which could be explored further in a fully-notated composition. The ideas of expansion and contraction of harmony are interesting, particularly when dealing with the perception of time. This idea has not been fully realised in any subsequent pieces; however, ways of coordinating expansions and contractions of harmony with similar rhythmic process in contradiction or alignment suggest a possible avenue for further investigation beyond my PhD research. The next piece of discussion, *Up an Down and Sideways,* does, however, consider basic possibilities of the coordination of harmonic and rhythmic processes.

	Pitch Centre	Modes Used	Number of Common tones	Common tones
Section 1	C	C Phrygian C Lydian	2	C, G
Section 2	G	G Aeolian G Lydian	3	G, A, D
Section 3	D	D Dorian D Lydian	4	D, E, A, B
Section 4	A	A Mixolydian A Lydian	5	A, B, C#, E, F#
Section 5	E	E Ionian E Lydian	6	E, F#, G#, B, C#, D#
Section 6	B	B Lydian	7	all tones

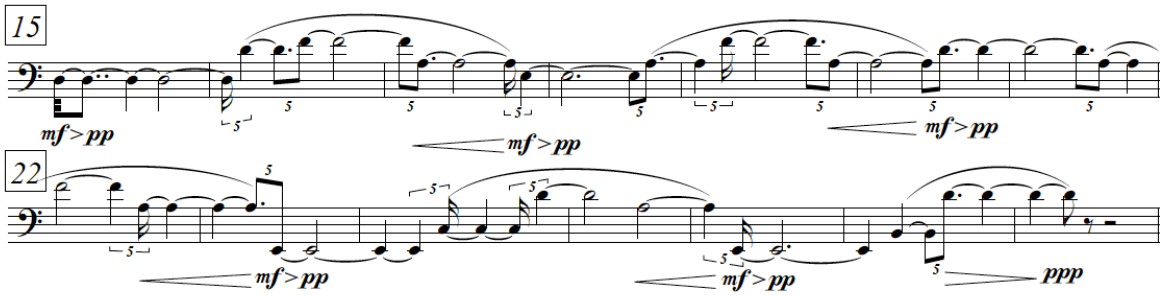
Figure 4.1: *Convergence* Harmonic Plan

Augmented Tango in *Up and Down and Sideways*

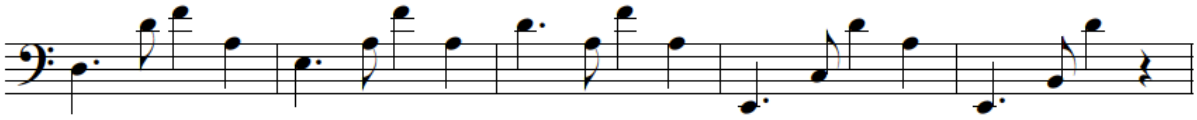
Up and Down and Sideways is one of the most systematically composed pieces of the portfolio, as the parameters of rhythm and pitch are both highly controlled. A long-range polyrhythm serves as the structural foundation of the piece incorporating an augmented tango rhythm. This tango rhythm is heard most clearly in the viola and bass clarinet parts, obsessively repeating at different rates, which only align at the middle and end of the piece, as two cycles of the polyrhythm are completed.[51] This structure is similar to the previously discussed *Nexus* in Chapter 2, so less technical explanation of my use of the technique is necessary. In terms of pitch, there are two related harmonic strategies in the piece which interact in contrasting ways with the polyrhythmic structure.

The first harmonic strategy is reminiscent of a harmonically functional tango with rhythm and harmony working in coordination to establish the conflicting pulse streams. Considering every dynamic swell in the bass clarinet part as a 'downbeat' of the tango rhythm, one could interrupt each phrase as a bar of 4/4 at a slower speed. Continuing with this perspective in bars 15-28, Example 4.1a illustrates each phrase is suggestive of an arpeggiated chord figuration common in the bass part of a tango. While the D minor chord is the only triad, the 'progression' of chords conforms to a steady harmonic rhythm. These bars are rewritten at the slower tempo for clarity in Example 4.1b. The clarinet also repeats this sequence of chords for the entire duration of the second cycle of the polyrhythm, bar 71 until the end of the piece. The viola repeats a similar sequence for the duration of the second cycle of the polyrhythm as well.

[51] Beginning at the tempo change, the second cycle is twice the speed of the first.



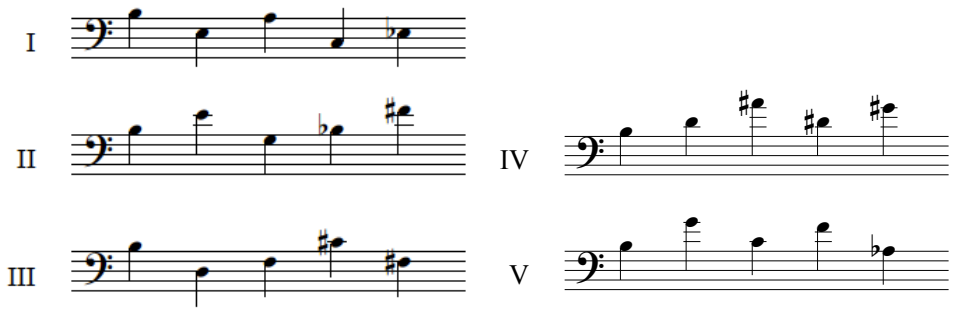
Example 4.1a: *Up and Down and Sideways*, Bass Clarinet (in C) bars 15-28



Example 4.1b: *Up and Down*, Bass Clarinet (in C) bars 15-28 rewritten in slower tempo

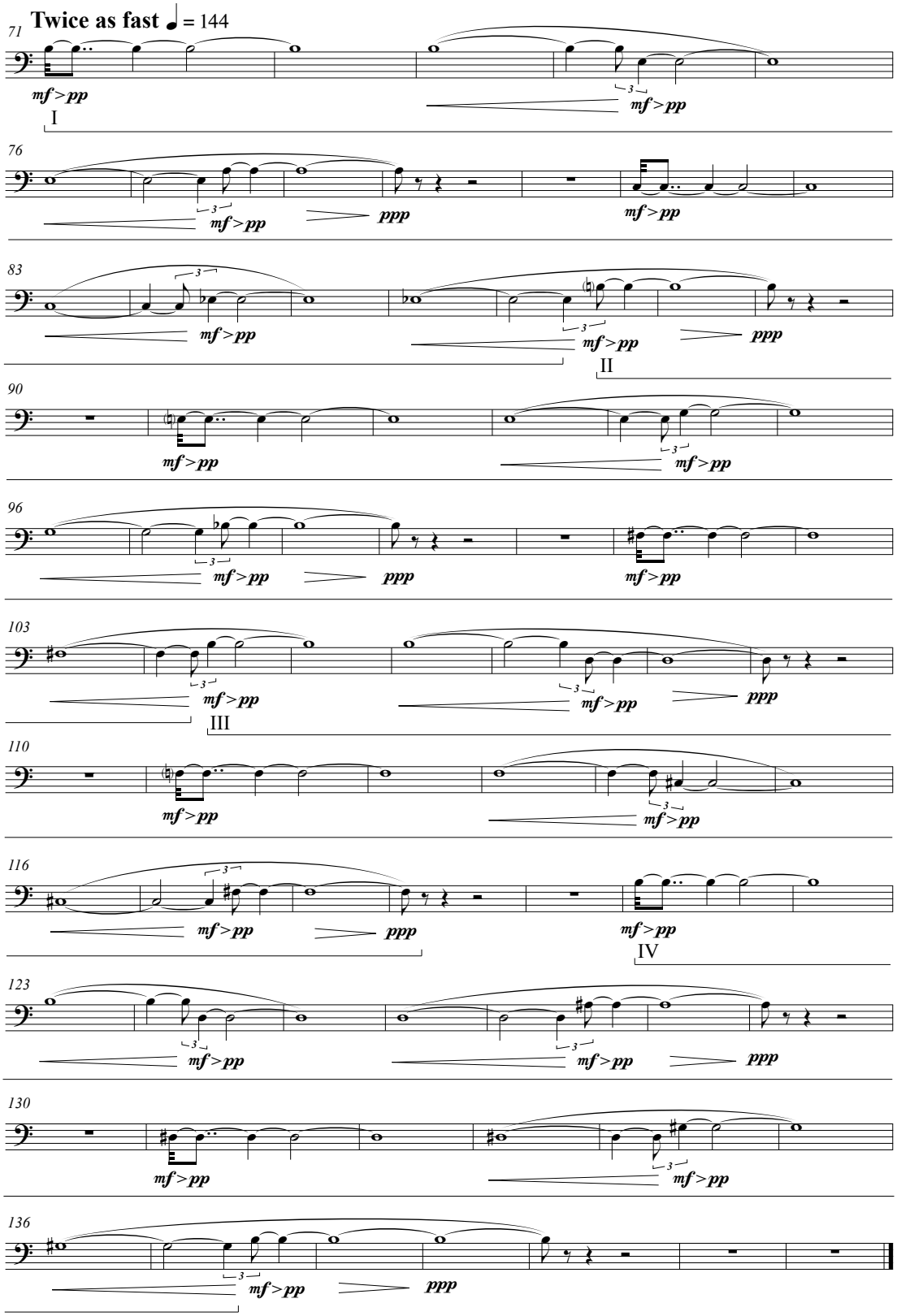
Rotation Technique in *Up and Down and Sideways*

The serial rotation technique serves as the second harmonic approach in *Up and Down and Sideways.* The piece uses the five-note cell B-E-A-C-E flat where each rotation is transposed onto the initial pitch, B. The transposed rotations are provided in Example 4.2. This pitch set and its rotations are used linearly in the trombone part throughout the entire piece, as shown in Example 4.3.[52]



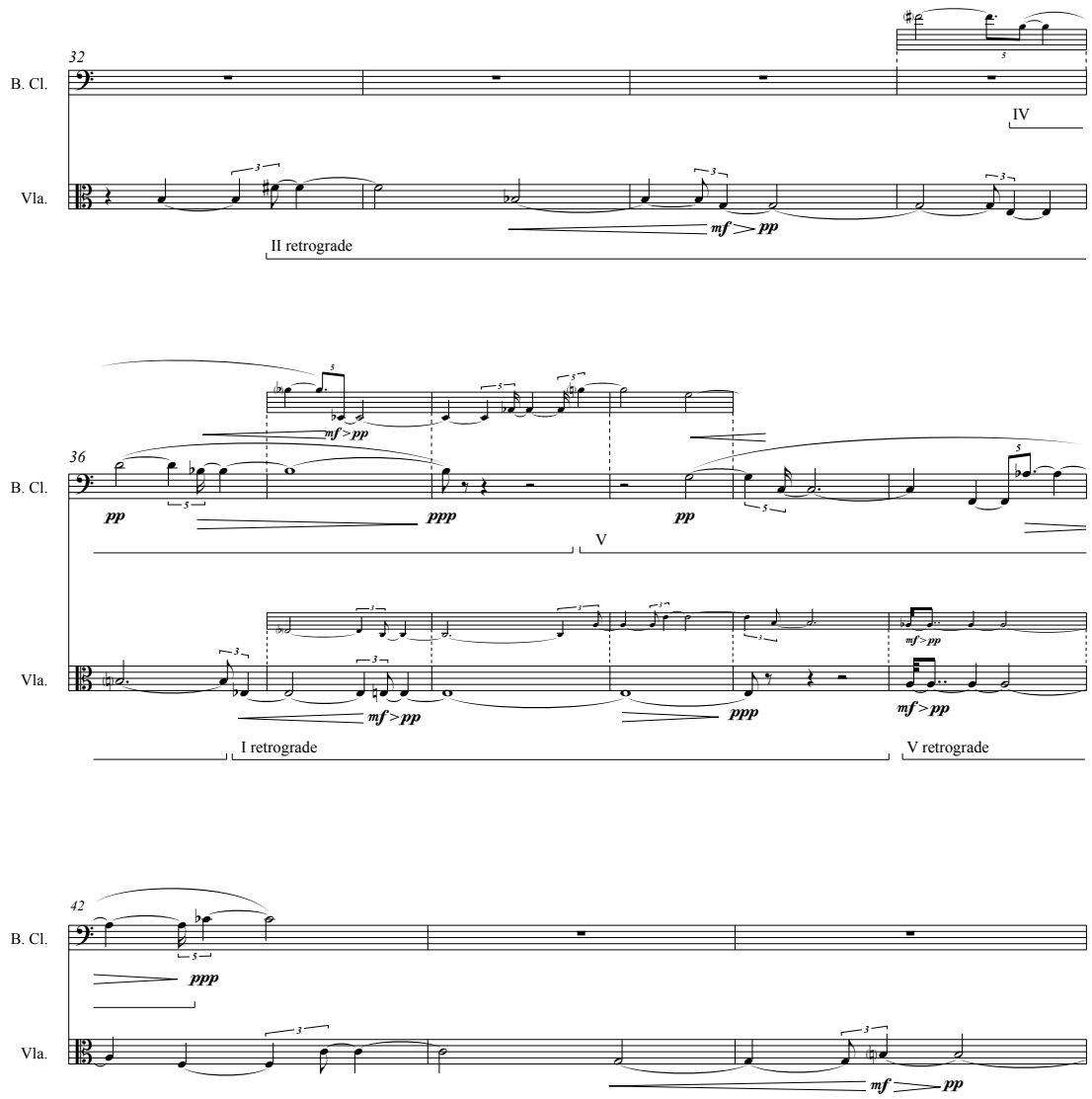
Example 4.2: *Up and Down and Sideways* Rotations

[52] The second complete polyrhythmic cycle is shown in Example 4.3. The trombone part for the first cycle is the same apart from the bars of rest.

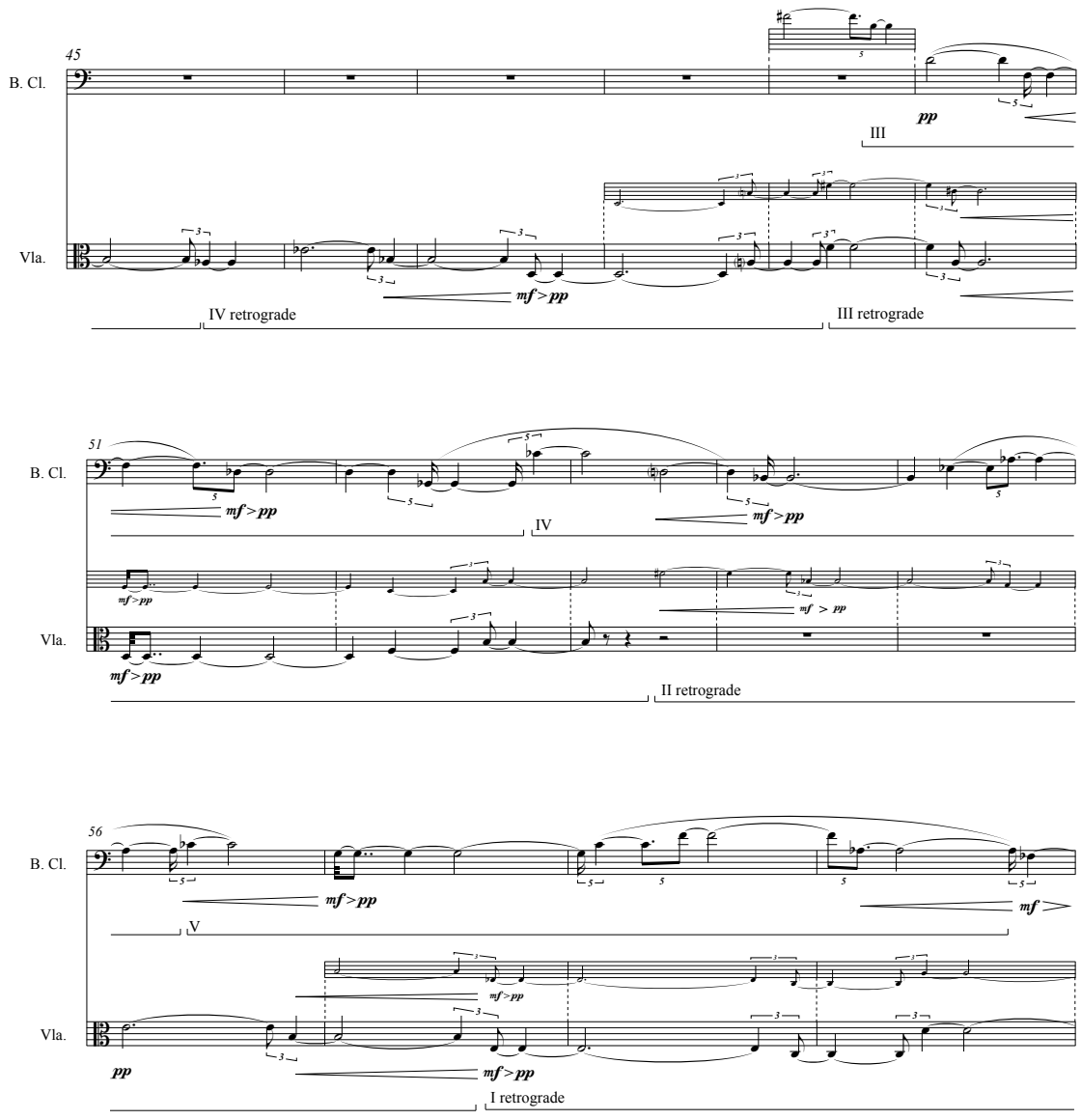


Example 4.3: *Up and Down and Sideways,* Trombone bars 71-end

The bass clarinet and viola also employ these chords linearly in the middle instrumental section of the piece; however, there is some alteration to the process permitted. Example 4.4 isolates the bass clarinet and viola parts labelling the rotations in use. An ossia is provided throughout the example to show how the process continues when interrupted by rest or where the system has been altered, usually to avoid a unison pitch. Considering the process was not perforated by rest, the ossia provides the starting pitch of the rotation for bars 35 and 49 of the clarinet part, whereas the continuation of the unheard process is shown beginning in bar 37 until it is reinstated by the clarinet in bar 39.



Example 4.4: *Up and Down*, Bass Clarinet (in C) and Viola bars 32-59



Example 4.4 continued

Similarly, the ossia in bars 37-41 shows the continuation of the process in opposition to the alteration in the viola part, and the interrupted process is continued in the ossia for bars 52-55 until the viola reinstates it in bar 56. Also in the viola part, the third and fourth notes of the retrograded Rotation III are swapped in bars 51 and 52 to avoid the unison pitch F in both instruments. Other pitches from bars 48-50 and bars 57-59 have been intuitively altered in favour of certain intervals.

As part of his discussion of Oliver Knussen's harmonic process, Julian Anderson points out two important aspects of the rotation technique. Because the interval content of the generated chords is entirely dependent on the original pitch set, they retain the basic essence of the original. They also serve as an extension and elaboration of the original chord exploring its internal interval characteristics thoroughly. Secondly, the generated chords can reinforce the prominence of the note on which they are all transposed, resulting in a 'focal point to the harmony, an easily recognizable modal tonic'.[53] Particularly when combined with the first harmonic approach discussed, the rotation technique complements the sound world desired, one that is simultaneously familiar and elusive.

Interaction of Harmonic and Rhythmic Processes

An important connection between the two harmonic approaches in *Up and Down and Sideways* is a minor triad, which can be built from the 5-note pitch set; however, both strategies feature a different harmonic focal point which interacts in contrasting ways with the rhythmic structure. While the D pitch centre of the first approach aligns with the 'downbeat' of the augmented tango rhythm, the focal pitch B of the rotation technique does not align with the rhythmic process during the discussed middle section, which diminishes its hierarchal function. As *Up and Down and Sideways* is a reduction of the second movement of my monodrama *The Yellow Wallpaper*, this evolving interaction of harmonic and rhythmic processes is discussed further in the next chapter following an introduction to the narrative and historical background of the story.

[53] Julian Anderson, 'Harmonic Practices in Oliver Knussen's Music since 1988: Part I', *Tempo,* New Series, 221 (July 2002), 2-13 (p.4).

Chapter 5: *The Yellow Wallpaper*

Based on the short story of the same name by Charlotte Perkins Gilman, my monodrama reflects on social isolation and its effect on mental and physical health through the eyes of a woman who is taken by her husband on a 'rest cure' in the country. Written at the end of the 19th century, Gilman's story portrays the unnamed protagonist's preoccupation with the ugly wallpaper in her sickroom as she becomes increasingly unhinged.[54] I was first drawn to the dramatic nature of the text, as well as the possibilities of the treatment of time relating to the development of a character. At first glance, the use of this text may be problematic in the modern context of feminism and mental health. Historically, many prominent male composers and librettists have framed madwomen in the musical canon by, as described by Susan McClary, projecting 'their own fantasies of transgression as well as their own fears onto women characters and performers'.[55] However, Gilman's story stands in contrast to these classic representations, as 'The Yellow Wallpaper' is a female's semi-autobiographical account written with the expressed purpose of addressing a mental health issue of the time. This makes the text appropriate for a modern setting.

'The Yellow Wallpaper' in Feminist Movements

Charlotte Perkins Gilman, a prominent figure within the first-wave of feminism is perhaps best known for her short story 'The Yellow Wallpaper'. The story is semi-

[54] 'The Yellow Wallpaper' is in the public domain and can be accessed via <image.guardian.co.uk/sys-files/Books/documents/2009/01/09/TheYellowWallpaper.pdf>.

[55] Susan McClary, 'Excess and the Frame: The Musical Representation of Madwomen', in *Feminine Endings: Music, Gender, and Sexuality* (Minneapolis: University of Minnesota Press, 1991), 80-111, pp. 109-110. See also Charlotte Higgins, 'Is opera the most misogynistic art form?', *The Guardian*, (26 February 2016) <www.theguardian.com/music/2016/feb/26/is-opera-the-most-misogynistic-art-form> [accessed 28 February 2016].

autobiographical in that, like the unnamed protagonist of her story, she too was prescribed eminent neurologist Dr S. Weir Mitchell's celebrated rest cure in 1887 following 'a severe and continuous nervous breakdown tending to melancholia'. Upon completing three months of the regimen, Gilman later reflected that the treatment, which included isolation and the prohibition of all physical and intellectual activity, drove her 'near the borderline of utter mental ruin'. It was only in casting the treatment away and returning to her work as a writer that she found solace. Delighted by her 'narrow escape', Gilman penned 'The Yellow Wallpaper' and sent a copy of her story to Dr Mitchell from whom she received no acknowledgement, but who did alter his treatment in reaction to her story.[56]

When it was first published in January 1892 in *The New England Magazine,* reviewers differed on the story's ultimate meaning. While some nineteenth-century readers considered the story 'a cautionary tale about the dangers of tasteless home decorating', others likened it to 'a Poe-esque study of psychosis'; however, almost all responses agreed explicitly on the story's powerful effects on the reader.[57] In response to readers who feared her story was madness-inspiring, Gilman wrote 'it was not intended to drive people crazy, but to save people from being crazy, and it worked'.[58] She claimed that 'the real purpose of the story was to reach Dr Mitchell and convince him of the error of his ways'.[59]

'The Yellow Wallpaper' is now taught widely in schools and colleges across America, largely due to the critical work of second-wave feminist scholars who, beginning in the 1970s, interpreted Gilman's treatment at the hands of Dr Mitchell as

[56] Charlotte Perkins Gilman, 'Why I Wrote "The Yellow Wallpaper?"' *Forerunner,* 4 (1913), p. 271.
[57] Jane F. Thrailkill, 'Doctoring "The Yellow Wallpaper"', *ELH*, 69/2 (2002), 525-566 (p.527).
[58] Gilman, 'Why I Wrote', p. 271.
[59] Charlotte Perkins Gilman, *The Living of Charlotte Perkins Gilman: An Autobiography* (Madison: University of Wisconsin Press, 1990) p. 121.

paradigmatic of the patriarchal silencing of women.[60] Jane Thrailkill addresses the discrepant reactions of Gilman's contemporaries and these more recent critics aiming to remain faithful to Gilman's stated purpose of convincing Dr Mitchell of the danger of his renowned course of treatment:

> '… recent critics have… subscribed (somewhat paradoxically) to the semiotics of psychoanalysis insofar as they privilege subtext over text, symbolic meanings over stated intentions, and sex over everything-even over Gilman's explicit feminist commitment to decoupling sex from the issue of women's work'.[61]

Thrailkill does, however, acknowledge the significance of the recent readings, ultimately agreeing with feminist critic Jean Kennard who argues that the 'value of our rereadings lies not in their "correctness" nor in our ability to demonstrate their intentionality…. but in their ability to enrich our present.'[62] Although Gilman may have disapproved of her story being used to establish a textual paradigm for gender difference, Thrailkill believes she would have been enthusiastic about its contribution to the founding of a vibrant, contentious field of study which has helped propel increasing numbers of women into academia.[63] Discussions of women's mental health have evolved from the 'hysteria'[64] commonly cited during Gilman's time to more deliberate assessments including the effects of social isolation[65] to which Gilman's protagonist is subjected.

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[60] See Sandra M. Gilbert and Susan Gubar, *The Madwoman in the Attic: The Woman Writer and the Nineteenth Century Literary Imagination* 2nd edn (New Haven: Yale University Press, 2000), pp. 89-92.
[61] Thrailkill, p. 528.
[62] Jean E. Kennard, 'Convention Coverage or How to Read Your Own Life', in *The Captive Imagination: A Casebook on "The Yellow Wallpaper,"* ed. Catherine Golden (New York: The Feminist Press, 1992), 168-90, p. 185; reproduced in Thrailkill, p. 553.
[63] Thrailkill, p. 553.
[64] Cecilia Tasca, Mariangela Rapetti, Mauro Giovanni Carta, and Bianca Fadda, 'Women and Hysteria in the History of Mental Health', *Clinical Practice & Epidemiology in Mental Health*, 8 (2012),110-119.
[65] Adil Akram and Andrew Kent, 'The Social Care Needs of Women with Mental Illness', in *Oxford Textbook of Women and Mental Health,* ed. Dora Kohen (Oxford: Oxford University Press, 2010), 147-226, p. 154.

One particular occurrence which I have explored in my monodrama is the distortion of time perception as an effect of social isolation.[66] My monodrama addresses this phenomenon through its rhythmic processes and temporal structuring with one significant exploration being the use of long-range polyrhythms specifically for narrative purposes.[67] As further detailed in sections devoted to individual movements, the interaction of conflicting pulse streams throughout the piece symbolises the disturbance of the perception of time as a result of her social isolation. For example, the long-range polyrhythm which structures the second movement allows for the superimposition of conflicting pulse streams to provide an unsettled backdrop for the protagonist's startling confession, as well as contribute to the distortion of the directionality of time. The piece also explores layering polyrhythmic cycles, as heard in the first movement, to correspond with the woman's first mention of the hideous wallpaper. Finally, in the final movement of the piece, tempo proportions and repeated material support the exploration of the idea of a time loop.

Libretto Collaboration

For this project, I have collaborated with Cardiff University postgraduate researcher in creative writing Christina Thatcher to adapt the original text. I first approached Thatcher to inquire about her interest in the project via email after reading

[66] Jean M. Twenge, Kathleen R. Catanese, & Roy F. Baumeister, 'Social Exclusion and the Deconstructed State: Time Perception, Meaninglessness, Lethargy, Lack of Emotion, and Self-Awareness', *Journal of Personality and Social Psychology,* 85/3 (2003), 409-423.

[67] Elliott Carter's exploration of long-range polyrhythms, spanning over a decade, runs opposite to mine. Coulembier details Carter's first use of long-rang polyrhythms as a form generating feature in his song cycle *A Mirror on Which to Dwell* in relation to the text in Klaas Coulembier, 'Elliott Carter's Structural Polyrhythms in the 1970s: *A Mirror on Which to Dwell*', *Tempo,* 261 (2012), 12-25. For additional discussion on the relationship between text and music in Carter's song cycle see also, Brenda Ravenscroft's 'Setting the Pace: The Role of Speeds in Elliott Carter's *A Mirror on Which to Dwell*', *Music Analysis*, 3 (2003), 253-282, and 'The Anatomy of a Song: Text and Texture in Elliott Carter's "O Breath"' in *Ex Tempore* 9/1 (1998), 84–102.

her poems available online. Following initial discussions, Thatcher condensed Gilman's prose into twenty-one poems updating some of the antiquated language for a contemporary audience. Upon receiving the initial poems, I suggested possible combinations to create more extended movements or scenes.

Thatcher felt strongly that the piece should be for a solo singer, despite the mention of other named characters in the story including the protagonist's husband John and a nurse named Jane. I agreed that a monodrama would be suitable for the narrative, as a single vocalist for the entire piece emphasises the character's isolation. Depictions of madness in monodramas are not uncommon, as they facilitate drama for a solo character.[68] As part of the initial stages of my work, I consulted the monodramas of Sir Peter Maxwell Davies, especially *Miss Donnithorne's Maggot* in which, similar to the beginning of *Eight Songs for a Mad King*, the use of asynchronous ticking is used as a representation for madness.[69] *The Yellow Wallpaper* explores similar treatments of conflicting pulses for narrative purposes.

'Heat Struck and Heavy'

The first movement of my monodrama takes its name from one of my favourite lines of Thatcher's libretto which corresponds to the woman's description of the setting for her treatment. Humid summers, which seem to hang with a considerable amount of physical weight on a person, served as an important impetus. As part of the movement, I wanted to explore weight, specifically with the gesture 'press' at the forefront. The

[68] Works such as Judith Weir's *King Harald's Saga* which require the singer to perform multiple roles provide another ingenious solution to the issue of generating drama with a single vocalist.

[69] My understanding of the evolution of Davies' exploration of madness is informed by Alan E. Williams, 'Madness in the Music Theatre Works of Peter Maxwell Davies', *Perspectives of New Music*, 38/1 (2000), 77-100.

directional quality of the semiquaver triplet embellishments leading into slow sustained pitches embodies the self-reflection of the character as she struggles with her new surroundings. While the directional quality of the triplet embellishments provides a burst of propulsive energy, the duration of the sustained pitches distorts any perceivable sense of pulse in the opening section.

The resulting texture created by these overlapping gestures in the strings was explored intensely as part of Dartington International Summer School's Advanced Composition Course in 2016 under the guidance of Judith Weir and the Heath Quartet. Sketches generated during the course were also worked into a stand-alone piece for string trio retrospectively entitled *Embers.* The exploration of tone colours throughout creates a haze, which, upon reflection, is also evocative of embers in several different ways. Sparks floating in the wind, pent-up energy in the form of heat unable to flame again, as well as the colour changes as minerals are oxidised into ash are represented.[70]

As previously mentioned, another aspect I am exploring through the composition of *The Yellow Wallpaper* is the use of long-range polyrhythms for narrative purposes. Throughout the entire piece, moments of convergence between polyrhythms contrast her sense of belonging and purpose against delusion brought on by coerced seclusion. In this initial movement, these changes coordinate with the opening and closing of the window to symbolise her connection, or lack thereof, to society. The polyrhythmic section of the first movement begins at the tempo change in bar 64 following the character's first reference to her isolation and the window which separates her from the world outside her room. This section timbrally expands the polyrhythm previously introduced in *Nexus*; however, the entire polyrhythmic cycle is not completed. Instead, a

[70] In 2018 *Embers* was expanded for string quartet and was performed by Quartetto Indaco as part of the HighSCORE New Music Festival Composition Program in Pavia, Italy. A recording of this performance is included as track 9 on the supplementary CD to the scores of the first volume of this thesis.

portion of it is layered underneath a full cycle of another long-range polyrhythm. This additional layer presents equally spaced articulations of a minor seventh interval, E-flat to F, denoting two contrasting, yet slowly converging, pulse streams in the horn and trombone. A similar polyrhythmic structure is used throughout the entire piece to correspond to the woman's obsessive description of the hideous wallpaper in her room.

'Up and Down and Sideways'

A long-range polyrhythm is also a form-generating feature in the second movement of the piece 'Up and Down and Sideways'. The text for this movement is placed just after the unnamed protagonist unsuccessfully pleads with her husband, John, to re-paper her room in Gilman's initial story. The movement incorporates a tango rhythm into the long-range polyrhythmic structure, to accompany the revelation that the woman sees a figure trapped behind the paper for the first time. The augmented tango rhythm can be heard obsessively repeating at different rates which only align at the middle and very end of the piece. These conflicting streams create an off-kilter background to the vocal part to inform the movement she sees in the paper, as well as the distortion of time she experiences.

While some instruments are more associated with specific pulse streams, the players are not confined to a single stream. This allows for a freer exploration of timbre which contributes an additional layer of obscurity to the temporal structure. The cello is most associated with Pulse Stream 1, while the viola is closely linked to Pulse Stream 2. The bass drum characteristically plays the pulsations of both streams, while the winds and piano generally serve to colour Pulse Stream 1, and the brass, violins, and double bass follow Pulse Stream 2. There is more deviation to this structure with

instruments weaving in and out of contrasting streams during the second cycle of the polyrhythm.

Figure 5.1 details how the conflicting pulse streams interact illustrating where points of maximum divergence and near coincidence points occur in a complete cycle in relations to specific beats. For example, the first near coincidence point occurs at the seventh pulsation of Pulse Stream 1 and sixth pulsation of Pulse Stream 2 about 72 beats into the piece, or just before and after the fourth beat in bar 17. The voice does not participate in any of these near coincidence points with one exception. This exception occurs in bar 87 in which the singer sings the second syllable of the word 'paper' in acknowledgement of the tangible material. Immediately following this, the woman admits that she sees a figure moving behind the paper, which will later be revealed to be a projection of her own imprisonment.

Additional aspects of this movement were previously introduced as part of a discussion of the smaller chamber ensemble version in Chapter 4, particularly in relation to the harmonic strategies utilized. However, the relationship between harmonic strategies and text has yet to be addressed. The central instrumental section from bars 34-62, the pitch structure of which is directed by the serial rotation technique, serves multiple purposes. As balance is a concern, the instrumental section allows the full ensemble to respond to the text without the worry of overpowering the voice. This section also serves the narrative, as the harmonic approach does not align with the rhythmic process.[71] Rhythmic convergences and harmonic 'resolutions' to the focal pitch do not align, contributing to the distortion of the directionality of time, despite the overall linear temporality of the piece.

[71] The interaction of harmonic and rhythmic processes is deliberately addressed in Chapter 4.

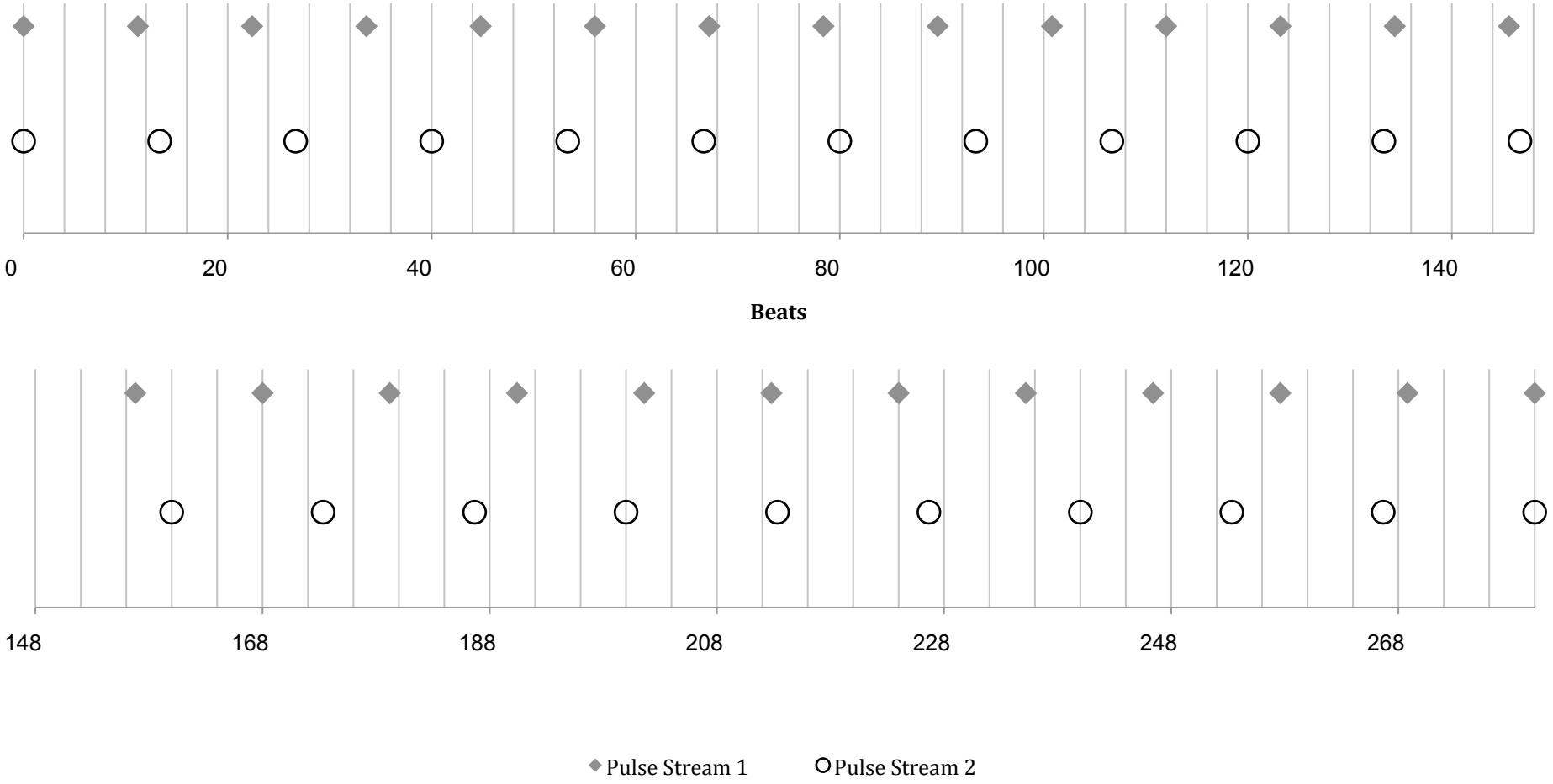
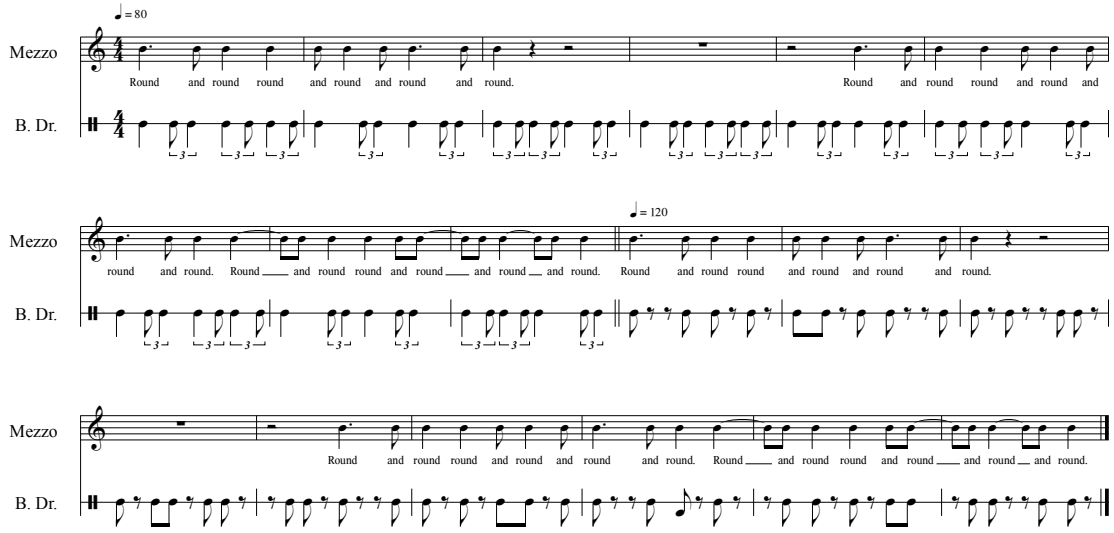


Figure 5.1: II. 'Up and Down and Sideways', Pulse Stream Graph

'Round and Round'

In the final movement of the piece, the idea of a time loop is explored. The polyrhythm from the first movement returns; however, it is clipped and repeated back from a different place multiple times. This method of construction corresponds to the narrative, as the woman is literally running in circles around her room ripping paper from the walls. It is not until she has finished her work removing the paper that she can escape.

The role of speed is important as well, as there is also a continuous element throughout the movement which is facilitated by tempo. Tempo in 'Round and Round' functions in a similar manner as in *Juncture*, where the formal tempo of the piece 'catches up' to the speed of a rhythmic pattern. Example 5.1 illustrates this process. The rhythm from the woman's 'round and round' refrain is written to sound at the speed of MM=120 until it is aligned with the formal tempo. This continuous element corresponds to the impending knocks on her door which threaten to interrupt her work.



Example 5.1: III. 'Round and Round', Tempo Strategy

Conclusion

The analysis provided throughout this commentary succinctly traces my investigation of temporal processes throughout the entire duration of my PhD research, as well as contextualises my work within the broader sphere of music composition. The research concepts discussed in Chapter One, including systematic rhythmic processes, as well as the significance of the perception of these processes, have led to new ideas relating to temporality. From initial discoveries of long-range rhythmic structures to their employment in my monodrama *The Yellow Wallpaper,* the portfolio demonstrates a process of exploration of rhythmic processes to guide both large-scale and local design and illuminates avenues for further research beyond my PhD studies.

As detailed in the analysis of string quartets *Juncture* and *Nexus* in Chapter Two, the techniques of metric modulation and long-range polyrhythms offer exciting solutions for the coordination of disparate elements. The use of long-range polyrhythms as a generator of material for local intuitive development, as traced in the discussion of the piano solo *Slowly Tilting, Sinking,* was also an important discovery for the evolution of my compositional practice. While I found *Nexus*, one of the most systematically composed works in the portfolio, less successful in terms of dramatic intent in general, the exploration of its long-range polyrhythm directly contributed to the success of *Slowly Tilting, Sinking*. The type of intuitive development incorporated into this piano solo also directed to another area of particular interest for further exploration: repetition as a function of form within long-range processes of continuity. Explorations along this avenue specifically offer new possibilities to explore time in music, particularly through the alteration of implied textural roles of repeating material to facilitate the realisation or dissolution of a groove.

The idea of utilizing systematic processes to generate material for more intuitive development has translated into parameters other than rhythm as well, particularly to my treatment of pitch and harmony. Before commencing my postgraduate research, I generally held the preconception that complying with a single harmonic approach was necessary to maintain coherence; however, I have found that convincing logic can be achieved when combining multiple harmonic approaches, particularly when they are carefully coordinated with long-range rhythmic structures. The combination of both an intuitive approach to harmony as well as systemic one in *Up and Down and Sideways* served as a particularly convincing case study for this realisation. While my harmonic approach remains primarily intuitive, the interaction of harmonic and rhythmic processes in coordination and opposition, as briefly discussed in Chapter Four, provides another opportunity for future investigation beyond my portfolio.

The decision to compose a monodrama brought forth another important question for my research: the role of rhythmic processes in a musical narrative. Chapter Three details how extra-musical stimuli generally influence the structural processes of a piece, rather than serve any programmatic function. The exception to this is when working with a narrative text, as discussed in the analysis of my song *Shadow Woman*. Rhythmic processes also serve a narrative role in my monodrama *The Yellow Wallpaper,* the source of discussion in Chapter Five. Specifically, the long-range polyrhythm in 'Up and Down and Sideways' allows for the superimposition of conflicting pulse streams to contribute to the distortion of the directionality of time. The role of long-range rhythmic structures within a narrative is another avenue for further investigation, possibly through the expansion of my monodrama beyond its current three movements. While long-range polyrhythms have been thoroughly explored in individual movements, as well as metric modulations and tightly-controlled tempo relationships, farther-

reaching rhythmic structures could be considered over multiple movements and longer-spanning pieces as a whole.

I am particularly grateful for the amount of time afforded during my postgraduate research to revisit pieces and material within interconnected works. Overall the most successful pieces of the portfolio combine intuitive elements and development of previously explored systematic processes which were more strictly adhered in previous cases studies. Throughout my PhD research, I have found unique ways to incorporate the techniques discussed into my compositional voice, particularly as part of the development of my rhythmic practice. The incorporation of the utilised processes complement my lifelong interests in dance and connecting with physical movement and have become important tools to realise my current aesthetic.

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