PORTFOLIO OF COMPOSITIONS:

EMOTION, MEANING & NARRATIVE IN ELECTROACOUSTIC MUSIC

by

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ABSTRACT

This thesis comprises a portfolio of acousmatic compositions which explore the evocation of emotion and the expression of meaning in electroacoustic music. These works, created and developed in the Electroacoustic Music Studios of the University of Birmingham, embrace both stereo and multichannel formats. In the accompanying Commentary, I also discuss compositional procedures and provide some analytical notes on each work, along with an outline of my own personal development as an electroacoustic composer during the period of the PhD programme.

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LIST OF PORTFOLIO COMPOSITIONS

Title	Year Composed	Duration	Details
Stress Vs Piece 1: Trepidation	2009	10:34	8 Channel
Stress Vs Piece 2: Ambivalence	2010	10:10	8 Channel
Stress Vs Piece 3: Perplexity	2011	10:54	8 Channel
Paperwork	2012	13:19	8 Channel
Kunchey	2012	7:39	8 Channel
Crystal	2013	12:05	8 Channel
Weaver	2014	16:04	Stereo

Total Time: 80 minutes and 45 seconds

CONTENTS

LIST OF FIGURES

DISC TRACK LISTINGS

Disc 1:

- Stress Vs Piece 1: Trepidation (a folder containing one 8-channel file and a folder containing the corresponding 8 mono files).
- Stress Vs Piece 2: Ambivalence (a folder containing one 8-channel file and a folder containing the corresponding 8 mono files).
- Stress Vs Piece 3: Perplexity (a folder containing one 8-channel file and a folder containing the corresponding 8 mono files).
- Read Me 1 (a file containing a diagram for the speaker layout).

Disc 2:

- Paperwork (a folder containing one 8-channel file and a folder containing the corresponding 8 mono files).
- Kunchey (a folder containing one 8-channel file and a folder containing the corresponding 8 mono files).
- Crystal (a folder containing one 8-channel file and a folder containing the corresponding 8 mono files).
- Read Me 2 (a file containing a diagram for the speaker layout).

Disc 3:

Weaver (a stereo file).

CHAPTER 1

INTRODUCTION

The following text is a commentary documenting the research undertaken during my period of registration for the degree of Doctor of Philosophy at the University of Birmingham, and outlining the resulting acousmatic compositions.

During my Masters degree at the University of Birmingham, I experimented with a narrative approach for my compositions with varying results. For the purpose of this commentary I will use the term 'narrative' to describe a sequence of events, a story, or what could be described as a journey that underpins the piece for me during the process of composition and through which I hope the audience would feel emotionally different at the end of the work. This narrative approach was thus used as a means of construction for the works and I found this mechanism an important tool during the compositional process. However I discovered that it was difficult to express a coherent narrative to others when using unrecognisable or unfamiliar sound material. The resulting conclusions then led me to formulate a modified approach in my compositions, in that I decided to lean more towards compositions which aim to evoke more generalised responses such as thoughts, moods and emotions.

My original PhD (Doctor of Philosophy) proposal stated the intention to investigate whether the outcomes of my modified approach regarding evoking emotions, would be

directly influenced by the sound material/sources used. In order to identify the success of using different sound materials, first I would create specific categories for the different sound "types". My categories were: acoustic sounds (sounds from whatever source, recorded in the studio and subjected to only light processing and editing); environmental sounds (e.g. water, birds, etc, recorded in the environment rather than the studio); instrumental sounds (processed recordings of musical instruments); and synthesised sounds (processed in real-time and non-real-time). Some pieces would be composed using sounds from just one of these categories (e.g. all acoustic sounds) and some pieces using combinations of types (e.g. environmental and synthesised sounds). Away from the narrative aspects, the music would also describe a setting/ambience in stereo and/or multi-channel (using multi-channel I enabled me to create a more realistic sound world that surrounds the listeners as in real-life).

Although the above original PhD proposal underpins the first series of compositions in the portfolio, after assessing the success of these works I continued to adapt and develop my approach, concentrating more on the broader aesthetic of the music rather than the 'category' of sounds used. Thus, the composition of the earlier pieces in the portfolio set out with a programmatic intention – i.e. the works were composed to a predetermined narrative thread, which was important for me when generating them. However in the second series of works in the portfolio, the focus is less on 'narrative' as defined above and more of a reflection of a child's enjoyment, fascination and imagination, and the pieces are therefore less linear in style. I found that through the course of the PhD I came to the conclusion that it was less important for the audience to understand the

specific intended narrative that was in my own mind during composition. I arrived at this conclusion through a gradual learning process facilitated by personal reflection of my work and from informal verbal feedback received from the audience. This informal feedback was usually given during conversations after the performances and was used as a learning method to evaluate the degree to which I was achieving my compositional aims. I decided to perform my pieces to audiences that varied in age and musical knowledge (especially in relation to their experience of electroacoustic music). This also included performing to children at school and then encouraging them to compose their own electroacoustic work. I chose to perform to a wide audience because I believed that their reception of the works would be influenced by their individual musical experiences. I will go on to discuss the research and my findings regarding this matter later in the commentary. In general I found that the audience grasped at the overall theme of the composition, but rarely understood the precise narrative that was in my mind during composition. Although audience members had differing understandings of the narrative or, indeed, had not come to the conclusion of the intended narrative, my 'interviewees' generally agreed that this did not detract from their enjoyment of the pieces.

All of the works in the portfolio focus on meaning, emotion and narrative in that they take the listener on an emotional journey. The structure of the works is formed out of careful development and evolution of sounds, which is also reinforced and emphasised with tonal gestures and cadential moments. These cadential events highlight climactic points often found at the end of a section or near the end of the work, similar to the way in which they are used in much western music. I also used tonality to outline key

temporal moments and highlight events that I believed to be important in the works. Personally, I enjoy listening to tonal moments in electroacoustic music and I found that these tonal moments not only assisted in the construction and development of the work, but often also aided the overall aim of evoking an intended emotion – for example discordance can frequently evoke a feeling of uncertainty. During the analysis of works I will identify key tonal points in the works and their overall effect.

To mix the compositions in the portfolio I used the program Nuendo; and for sound processing I used GRM Tools (e.g. Freeze, Equaliser, Bandpass etc…), BEASTtools, MaxMSP, Soundhack and Audio Sculpt. This software was readily available in the Studios and affordable enough to install on my own computer. Also I believed that using this varied selection of tools would enable me to compose intricately processed sounds as well as precise panning and distribution across 8 channels (most specifically from using BEASTtools).

CHAPTER 2

STRESS VS PIECE: EVOKING EMOTION IN ELECTROACOUSTIC MUSIC

In the past and present, many composers and artists have worked on pieces in the hope of evoking emotions in the audience. The trilogy entitled *Stress Vs Piece* was composed to evoke specific emotions that I believed to be related to the feelings associated with stress – for example anxiety. In the following chapter I will discuss my research into evoking and representing emotion through electroacoustic composition, as well as an assessment of success in doing so. The chapter will also include more detailed descriptions and evaluations of the works in the trilogy.

During my research for my Masters in Music and Bachelor of Music at the University of Birmingham, I concentrated on the 'power' of emotion and narrative in music. It quickly became apparent to me that composers for centuries had been attempting (and often in my opinion successfully) to evoke specific emotion in their listeners. The choice of mode or key for the music to be written in was once, and often still is, a crucial decision for the composer when creating an 'emotional' composition. An example would be where a composer would have chosen the Hypodorian mode or a minor key to express a sad emotion/feeling, or the Lydian mode or major key to express a happy emotion/feeling. I also found that musical devices were commonly used to mimic human behaviour and response in other context, for example the use of 'Mickey Mousing' (a film technique in which the actions on the screen and the accompanying music are

closely synchronised), or the musical recreation of a 'pounding' heartbeat to build tension and fear. I decided to use this knowledge and research ways in which I could adapt methods like these for use in electroacoustic composition.

The trilogy *Stress Vs Piece* was also composed as an investigation into the success of evoking emotion when using a range of different sound material and the extent to which understanding might be influenced by how recognisable and identifiable the sound is, as opposed to sounds subjected to differing degrees of transformation. Each of the three works had a different category of sound material: a mixture of both natural and processed sound sources; recognisable and limited processing; and heavily processed. In order to compare the success of the three compositions I used the same sound sources and recurring musical themes as my starting point.

2.1 Emotion and feeling in music

As a listener to or observer of art, one spontaneously starts to map associations and meaning using past experience and understanding. The outcome is a learned/conditioned response, which in this case is a specific emotion or feeling. Here the working memory and long-term memory are working together to create and identify schemas. One creates a schema (idea of expectation) after being repeatedly presented with the same symbols and outcome. For example, if hearing music in the Hypodorian mode repeatedly makes the listener feel sad, the presence of this particular mode in a

piece would cause the listener to produce a schema in which they would expect to feel sad. Kendall (2008) explains how background knowledge and schemas lead the listener to anticipate musical and auditory patterns that they believe fit the current context. He also explains how the composer can manipulate signals and auditory perception to guide the listener to the desired response.

The aim in my trilogy *Stress Vs Piece* is to evoke the feeling of tension and release (stress and tranquillity). In order for me to evoke these emotions I had to identify possible signifiers and schemas that would lead to the desired response. I used my personal experiences and questioned others about theirs, leading me to choose a selection of sound sources and what I will describe as musical devices for use in the works. The sounds I chose included traffic noise and an alarm bell, both of which I associate with feeling stressed. Upon hearing these sounds, my working and long-term memory led me to feel stressed by relating my current response to feelings experienced when presented with the same sounds (or sound palette) in my past. I have frequently felt apprehensive in busy traffic, concerned about being late and often quite stressed. When hearing an alarm bell, I often feel shocked, stressed and even slightly panicked. This is a learned cognitive response caused by the learned association of the sound of an alarm bell and the context in which it occurs – for example, a fire alarm or an alarm clock. Both contexts I find unpleasant and therefore hearing the sound of an alarm bell causes me to experience an unpleasant emotion. From speaking with others (both composers and non-composers), I became aware of a positive correlation between our responses to these aforementioned

sounds, and therefore I believed that these source sounds would be good signifiers to use in my compositions.

2.1.1 The interaction between mental layers in relation to feeling

In his paper entitled "The Feeling Blend: Feeling and Emotion in Electroacoustic Art" (2014), Kendall identifies five different layers of mental cognition that come in to play when a feeling is evoked. These layers are: Sensations, Gist, Locus, Contexts, and Domains. The Sensation layer is the first layer and is the immediate response to the stimulus. The Gist layer develops from the initial responses and starts to build a framework of the events when presented over several seconds, enabling sustained awareness in the short-term memory. Kendall states how at this layer, the listener starts to make links between the "qualia and flow dynamics" and previously learnt schemas. The Locus layer is where the mind takes note of the schemas and conditioned emotive responses developing in the Gist layer, and starts to anticipate events in the 'perceptual present' and slightly beyond. The Contexts layer is where the framework is developed for enlisting and assessing medium- and long-term event-oriented schemas and expectations over an extended time frame. There is the manifestation of basic emotional responses when assessing the present and anticipating future events using long-term memory schemas. The Domains layer is where there is an analysis of events against the background knowledge in the long-term memory. If the events are inconsistent with the

schema in the long-term memory, the interplay between the feeling layers will start again and a new feeling will be evoked. Despite Kendall's definitions of these distinct layers, they are dynamic and the movement between them bidirectional. Also the response and timeframe is extremely quick and mainly occurs subconsciously. Although it is difficult to identify or control or to identify which layer is in play at any one moment, Kendall's framework does reiterate the importance of being consistent with a schema and triggering the desired initial response, when composing music aiming to evoke a specific emotion.

2.1.2 Psychological approaches to conceptualising emotion

Many psychologists have conducted research into the conceptualisation of emotion in art and have outlined different approaches in which to do so. Juslin and Sloboda (2010) outlined three major approaches to conceptualising emotion: the Categorical approach; the Prototype approach, and the Dimensional approach. The Categorical approach is where they suggest that people experience emotions that are categorically distinct from one another. Here the listener would be placing the emotion in a basic emotional category – for example, am I feeling happy or sad? I believe that each of the emotional categories would have definitive elements that would then correspond with a suitable schema – i.e. when the music is mapped to a specific schema, the listener categorises the emotion felt based on the conditioned connection between the schema and category. I believe that it is therefore important that I am aware when composing, of the category of

emotions I want to evoke, the schemas associated with that category and the musical signifiers associated with the schemas.

The Prototype approach suggests that there is a hierarchal arrangement of emotions. Shaver et al (1987) stated that at the top level of the hierarchy is the simple emotion of positive and negative response. The middle level is the 'basic emotions' such as happiness, love, sadness, anger, fear and disgust. The bottom layer would be more complex emotions related to the emotion in the middle layer, for example the feeling of love in the middle layer would be followed by adoration, caring, compassion etc, in the bottom layer. In this approach the listener is taken on a journey through the emotional hierarchy leading to more complex layers. I believe it is therefore important that the initial response/basic emotion is the correct one to lead the listener down the desired 'path'.

The Dimensional approach to conceptualising emotion is an approach in which the emotions are organised along a small number of dimensions. An example of a dimensional theory is the circumplex model, where an emotion can be characterised according to its location along two dimensions: active–sleepy and pleasant–unpleasant. North and Hargreaves (2008) used this model when investigating the liking of and arousal by music, and the resulting emotions. An example they use in their book *Social and Applied Psychology of Music* (2008) identifies how the emotion 'tension' can be characterised as a combination of active and unpleasant. Rickard (2004) also used this model with the two dimensions being 'liking' and 'arousal', and he found that the

expressed emotion could be predicted by a combination of pleasantness, arousal and familiarity (see appendix 1). In this approach there is a continuum along which the emotion could be charted. Because of the wide range of such a continuous scale, I believe it would be difficult to reach a firm conclusion that a specific emotion can be found at one given point. Although the Dimensional approach, with regard to the circumplex model, does not aid my compositional style, it is useful when analysing audience response and the trilogy's success. Also, when researching the circumplex model, I found that many psychologists had reported a correlation between the amount of arousal and the strength of the emotion evoked. Schubert (2004) identified that such a link was particularly strong when changing the dynamics (volume) or tempo (speed) of the music. I can conclude from Schubert's findings that by changing the dynamics and tempo in my compositions, not only can I change the emotion evoked, but also the strength at which it is felt. According to the cognitive theory of Schachter and Singer (1962), the arousal determines the strength of the emotion and the context determines the type of emotion experienced.

Hevner (1937), another researcher who conducted several studies into conceptualising emotional response to music, arranged 67 such responses into what she labelled an 'Adjective Circle' (see Appendix 2). The circle comprises eight groups in which the 67 emotional responses are divided and spread according to their place against the four bipolar scales – for example, Group 6, containing the emotion 'happy', is opposite Group 2 that contains the emotion 'sad'. Hevner summarised her findings and created a table listing the musical properties which evoked the emotion as well as its weighting in

importance. According to her findings the emotion 'agitated' (in Group 7), would be best evoked by a fast tempo. The emotion of agitation is something that I would associate with stress and therefore want to evoke in the trilogy; Hevner's table consequently leads to the notion that a fast tempo should be used.

2.1.3 Intrinsic and extrinsic musical meaning

Many philosophers, psychologists and musicologists have researched emotional responses to music in relation to intrinsic and extrinsic factors. The intrinsic theory relates to the music itself whereas the extrinsic theory relates to contextual associations. However, I believe that it is possible for music to have both intrinsic and extrinsic meaning.

Meyer (1956) proposed the theory that the intrinsic meaning is derived from expectation. Through the exposure to a particular music one becomes aware of stylistic features and thus makes assumptions with regard to musical expectations. For example, being exposed to 'sonata form' would lead to the expectation of how the music in a 'sonata' will develop. Meyer argues that deliberately violating the expectation leads to an emotional response. Using the above idea, I could deliberately mislead the listener to expect the development of the work, but then change direction. As a result, the music would then evoke an emotional response of uncertainty, suitable for the overall desired response for the trilogy.

The extrinsic (or referentialist) approach suggests that musical meaning is "… derived from the extra-musical and contextual associations of the sounds." (North and Hargreaves, 2008, p.134) It also suggests that the emotional response is triggered by cues, either 'iconic' or 'associative'. The iconic cue refers to the resemblance of a musical event to a particular non-musical event – for example a fast tempo/pulse resembles a fast heartbeat. I felt that using iconic cues similar to this in the trilogy could lead to a stronger and more reliable desired emotional response. Associative cues relate to the learned association between the musical event and the non-musical factors that have emotional meaning – the traffic sounds I have been conditioned to associate with the feeling of stress (as described in 2.1) are thus associative cues. I believe that associative cues were useful in the composing of the trilogy. However, they are idiosyncratic in that the association, and therefore the response, would vary from person to person. This variance leads to a problem in ensuring that the desired emotion would be evoked in all listeners.

2.1.4 Possible problems when attempting to evoke emotion in music

Successfully evoking a specific emotion in all listeners is a difficult task – as just mentioned, responses can vary from person to person because each person has had different experiences. When relying on an emotional response to a trigger, the composer is presuming that the listeners would all have the same association with the trigger and,

therefore, the same schemas and background knowledge. However, this is impossible to achieve. The composer may know that the members of the audience are experienced with a particular genre of music and therefore have associations/expectations from the intrinsic meaning of the music, but it is impossible to be sure that all of the audience have had the same non-musical experiences and would have the same response to associative cues. North and Hargreaves (2008) note how difficult it is to evoke the same emotion in several people, as this varies considerably from person to person and can even change for one individual over time. New conditioning can occur and replace the old associations in the memory, leading to a new response. In film music, for instance, strings were often used to indicate romance. After the Hitchcock film *Psycho* (1960), however, the association arguably changed to horror (a different technique was used to play the strings, for example quick repeated down-bow sforzandi). Again, this presumes that the audience is familiar with film genres and the music /performance techniques used in them.

Frijda (1989) highlights the issue that the emotional response to an artwork is different from the emotion evoked by the comparable 'real' event because the audience is aware that it is not real. In the trilogy I can create a sonic image of busy traffic; however, the listeners will know that the traffic is not really there, as they are sitting in a room far removed from the traffic and therefore feel a different emotion from the one they would feel if they were in real traffic. To overcome this problem and make the traffic sound seem more 'real' I can utilise 8-channels and diffuse the sounds in a way that I believe resembles moving traffic.

Holbrook and Gardner (2000) raise the issue that mood is a dynamic variable which can change according to the context. For example, a section of music evoking a 'sad' emotion would elicit a stronger response if preceded by a section evoking a 'happy' emotion. With regard to my composition, I could strengthen the emotional response to my music by composing sections with contrasting moods, or the piece could be performed after a contrasting work in a concert. However, if the whole piece is to convey one emotion and I have no control over the order of performances in a concert, my composition may not successfully evoke the desired emotional response.

2.2 *Stress Vs Piece*: analysis of works in the trilogy

As outlined in 1.1, the *Stress Vs Piece* trilogy was composed as an investigation into the success of evoking emotion when using different sound material/categories: a mixture of both natural and processed; recognisable and limited processing; and heavily processed. The fundamental recordings/source sounds that I used for the trilogy are the same for each piece; this was done purposely, in order to compare the success of each piece but also to create a coherent sound world for the trilogy. Each piece is carefully paced and structured to present a sense of stress, anxiety (*Trepidation*), conflicting feelings (*Ambivalence*) and uncertainty/confusion (*Perplexity*). Throughout the compositional process, I remained focused on creating sounds and events that could evoke the desired emotion/feeling, using the research outlined in 2.1 to develop my compositional style to

do so. This included concentrating on possible 'event schemas' and extrinsic musical meanings of sounds, and I also used Hevner's 'emotional response table' (1937) (see 2.1.2). I therefore chose the sounds and sound qualities, which I believed would have a common association with the feeling of agitation and stress with extreme care.

The trilogy is an 8-channel compositional suite, using a speaker configuration commonly referred to as the 'Double Diamond' in the BEAST studios (see Appendix 3 for the speaker layout/channel routing). I chose the 'Double Diamond' layout because it allows for a speaker to be front-centre and back-centre. This was important for me because I wanted to place certain sounds directly in front of the listener (as explained later in the analysis of the individual works). The panning and movement of the sounds around the speaker array plays an important role in expressing and evoking the desired emotions of the trilogy. To create unease in the listener, quick movements around the sonic space contradict the more static moments. In general, I chose the higher pitched sounds to move at a faster rate than the lower pitched material, therefore echoing the physics of sound in which the high frequency sounds have a faster oscillation rate.

The trilogy was composed in the University of Birmingham Studios using the Steinberg software Nuendo and processing plugins/tools such as GRMtools and BEASTtools (BEASTtools was being developed at the University during the time that the trilogy was created). I used BEASTtools to create the majority of the 8-channel sound files; the Multi-Delay tool was used to create most of the iconic effects of the trilogy, for example:

the moving circle of bells in *Stress Vs Piece 1: Trepidation* and the tinfoil 'flutter' in *Stress Vs Piece 2: Ambivalence*.

The trilogy was inspired by a number of works, including: *Pentes* (1974) by Dennis Smalley (1974), *Tropes* (1991) by Robert Normandeau, *Bye Bye Butterfly* (1965) by Pauline Oliveros, *Forêt Profonde* (1994-96) by Francis Dhomont, and *Anecdotes* (1979-89) by Yves Daoust. Other works have also influenced my ideas, although the above-mentioned will be addressed in the following analysis of the trilogy.

2.2.1 *Stress Vs Piece 1: Trepidation*

Stress Vs Piece 1: Trepidation represents an individual's lifelong struggle between turmoil and tranquillity. From the recognisable alarm bells to the more surreal sounds, the conscious and unconscious worlds are opposed to one another. In this instalment of the trilogy, the sounds used are a combination of the recognisable natural and the unrecognisable highly processed.

In order to evoke a specific emotion or feelings, I believed it was important in the composition to start with a sound that had strong associations with a context/emotion that I wanted to represent. The composition therefore starts with the sound of a ringing alarm bell that rapidly increases in volume before being 'cut off' by a new sound – an initial purposely recognisable, almost iconic sound is used in an attempt to trigger the desired

emotion in the listener. The extrinsic musical meaning that I was aiming for was that of an alarm indicating an emergency or an alarm from an alarm clock. Both contexts may be associated with the emotions of anxiety, fear and shock, all of which would aid the overall theme of the piece. Starting with the alarm bell is an attempt to startle and destabilise the listener also the rapid crescendo suggests a notion of urgency. I chose to place the alarm sound in a single channel to suggest that the alarm bell exists in a 'real' sonic world. Likewise, there is no panning of the sound because by moving the sound around the space, the 'real' element would be lost. This is because the listener has cognitively learnt that an alarm bell does not generally move; panning would therefore contradict the listener's schema of the sonic image. I decided to start the composition in the 'real' world and then quickly move to an 'imaginary' world in an attempt to evoke the emotions of shock and uncertainty (in the trilogy, the 'imaginary' world represents the unconscious mind, including thoughts and dreams). The alarm bell is stopped by a reverberating unrecognisable sound with metallic properties. This metallic sound is diffused around the listener using the Multi-Delay tool in BEASTtools; however, the initial sound of this metallic rhythm is heard from behind the listener. I deliberately chose to place the sound behind the listener not only to contradict the alarm bell at the front, but also because I believed that hearing a sudden new sound from behind would alarm the listener and further provoke feelings of shock and unrest. The metallic sound was processed using time-stretching and filters in order to remove the sound from any recognisable source material. This was deliberately done in order to move the listener quickly from the natural to the unnatural (the real to the imaginary), adding to a sense of unrest and discomfort.

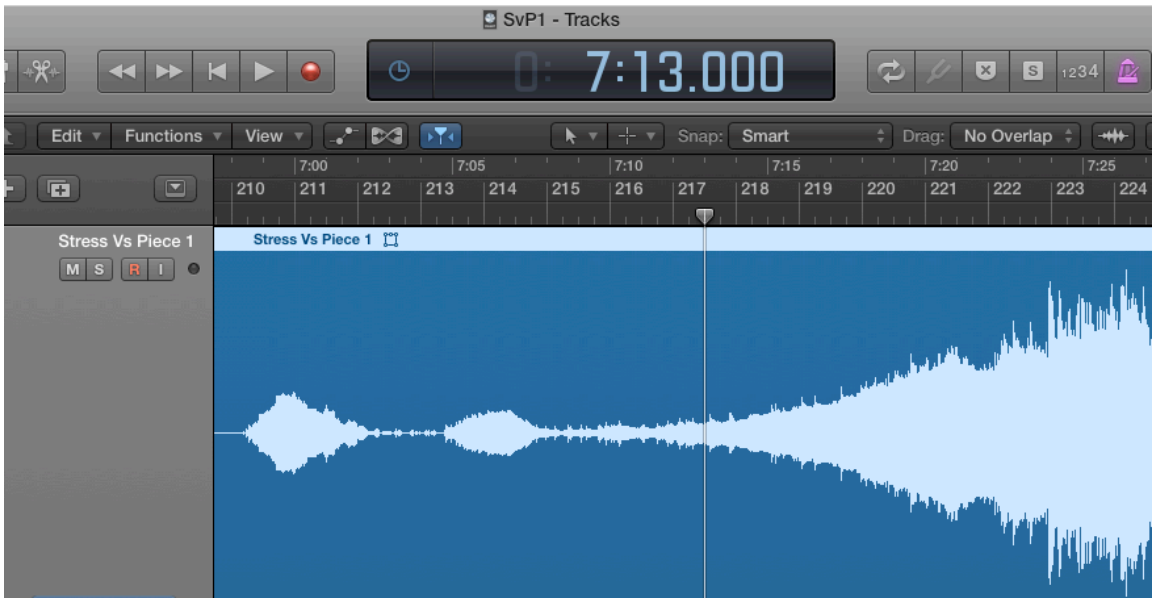


Figure 2.1: Screenshot using Logic Pro X for *Stress Vs Piece 1:Trepidation*

When composing the work I started with what I believed would be the main focus of the piece, this was the 'Alarm Bell Section'. I started the compositional process in this manner because I wanted any prior section to be leading to this moment and anything that followed to be a conclusion. The section starts at 7'13" (see figure 2.1) and is predominantly produced through both pitch shifting and time stretching of the original bell sound, in order to create the moving circle of bells (the iconic idea for the series as identified in 2.2). The alarm starts in the distance and then gradually enters the foreground as new higher-pitched variations of the sound are introduced around the listener in a clockwise motion. The finishing effect is of a chord that surrounds the listener. This section ends with the mechanical sound of the bell being the main focus, before fading into the next section, starting at 8'06", with the reintroduction of the 'fluttering' Chinese stress ball sounds.

Other iconic materials that are used in *Stress Vs Piece 1: Trepidation* are road traffic sounds and 'rattle-like' sounds. The road traffic sounds were used because of the common association between traffic and stress, whereas the 'rattle' sounds were creatively used to represent the idea of thoughts 'rattling' around one's head. As with the alarm bell sound, these sounds recur at different points in the composition; they are changed slightly each time through the use of using different processing tools. The recurring alarm bell is deliberately placed to keep reminding the listener of the feeling of urgency and alarm/panic. When the traffic sounds are first introduced, the equalisation used creates a sound that is recognisable and reminds the listener of hearing the sound 'through' something – for example, blocked ears. This implies that the stress has caused a form of barrier to the outside world, limiting what the listener can process/hear.

Smalley's *Pentes* (1974) was a huge influence for this work. His ability to create a sonic landscape and evoke strong emotions/feelings is exciting and interesting. He uses dynamics and pulses to express peaks and bursts of sound that lead the audience to a 'false sense of security' before shocking them with loud bursts of sound. He also uses a mixture of recognisable and unrecognisable sounds, similar to my approach in *Stress Vs Piece 1: Trepidation*. The 'haunting' sounds of the Northumbrian pipes emerge from the 'soundscape', prompting a new emotion. The pipes are recognisable and therefore the listener starts to evaluate the sounds that they hear in terms of the sound-image schema (extrinsic musical meaning). The unexpected change from the 'unrecognisable' to the 'recognisable' and the strong feelings that the change evokes, influence the contradiction of the 'real' and 'imaginary' worlds in *Stress Vs Piece 1: Trepidation*. Similarly,

Normandeau's *Tropes* (1991) uses 'metamorphosed' sounds (instrumental sounds transformed through processing) that are interspersed with recognisable sounds (the piano).

2.2.2 *Stress Vs Piece 2: Ambivalence*

In *Stress Vs Piece 2: Ambivalence,* the main objective was to use sounds that are not highly transformed from their original source recordings and therefore retain recognisable natural characteristics. The overall setting represents the conflicting feelings in the consciousness after stress.

In comparison with the first piece of the trilogy, *Stress Vs Piece 2: Ambivalence* expresses the 'calm after the storm' (peace and rest after stress and turmoil). To create this mood I used a slower pace in the development of ideas and employed sounds with with more peaceful extrinsic musical meanings. The slower pace/tempo has intrinsic musical meaning – 'sad' or 'peaceful' music tends to be slow. The sounds recorded from wind chimes and Chinese stress balls have iconic cues that are extrinsically associated with peaceful or restful events (the Chinese stress balls are also a link to *Trepidation* where these particular sounds also feature). However, during the piece there are moments which refer back fleetingly to 'frenzy' and turmoil. This is to express the idea of one remembering the stressful event that in turn causes one to start feeling the emotions felt at that time. I expressed this idea in the music by juxtaposing sustained and

repetitive reverberating sounds, from 'peaceful' sources such as wind chimes and the Chinese stress balls, against the more ambiguous fast moving sounds. This idea can clearly be heard in the section starting at 2'29" where the repetitive and reverberated, pitch-shifted wind chime sounds provide a centre for which other bell-like and ambiguous 'mechanical' sounds develop around. The idea then fades into the 'Traffic Sound' section noted by the 'whoosh' sound at 4'14". The aim was to express conflict and interrupt the listener's focus, whilst the sounds 'clash' and overtake one another. I believe that this is similar to Dhomont's *Forêt profonde: Chambre d'enfants* (1994-96) in which sounds and gestures are juxtaposed in such a way that feelings of tension and uncertainty are evoked.

In *Bye Bye Butterfly* (1965), Pauline Oliveros uses high frequencies that remind me, because it relates to the extrinsic implications of fear and pain that I had previously learned, of people screaming. In a similar manner, the frequency bands of the sounds I used were important to me when attempting to express specific emotions/contexts. High frequencies and pitches were used to represent the ringing in one's ears when stressed or suffering from high blood pressure. My hope was that this representation could instil in listeners an emotion similar to stress because of the sound-event schema and the extrinsic meanings they already known.

For this composition, I used sounds that had limited processing and were therefore categorised as acoustic or environmental sounds (according to my sound categories identified in chapter 1). Only EQ and pitch/time shifting were used and, as a result, the

sounds retain recognisable qualities. This was a personal compositional challenge because I had not previously limited myself to using one sound "type".

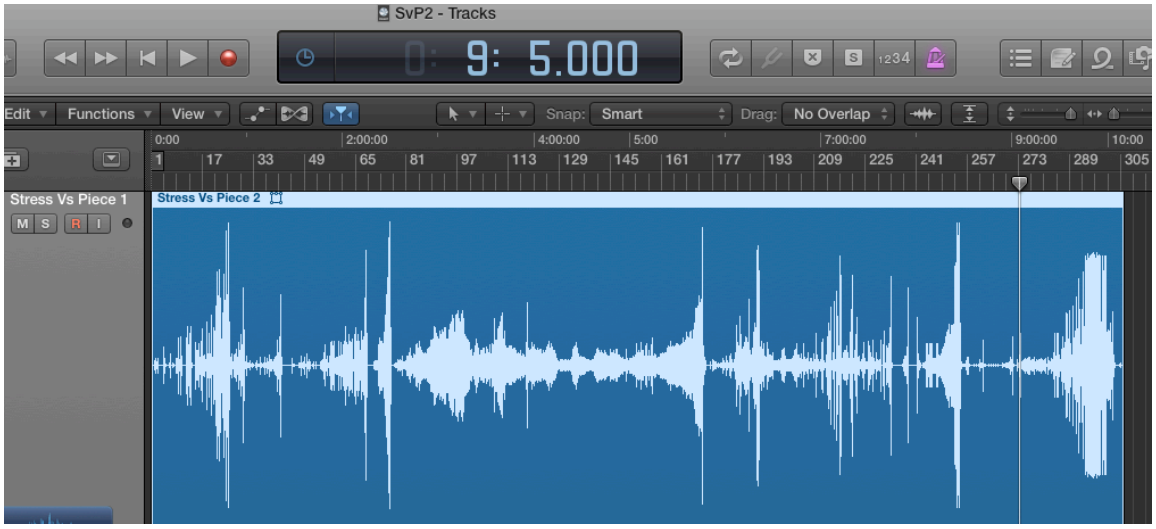


Figure 2.2: Screenshot using Logic Pro X for *Stress Vs Piece 2:Ambivalence*

The work is connected to the previous piece through the use of the same sources and similar events. The alarm bell sound is heard on a few occasions to create unity between the pieces, but also because of the extrinsic musical meaning of the sound (as outlined in 2.1.3). A spatial gesture heard in all three pieces is a clockwise circular motion that also rises in pitch, starting and finishing front-centre of the listener. In this piece the sound used to create this effect is the Chinese stress ball, rather than the alarm bell sound in *Stress Vs Piece 1: Trepidation*. Multiple overlapping iterations of this sound are heard around the ring of eight speakers. Each time that the bell is heard, the pitch has been raised producing an overall major chord, with the added seventh interval to add tension. This effect was created using a multi delay tool and changing the playback rate in BEASTtools and can be heard in the penultimate section starting at 9'05".

The movement around the space is of great importance in this work; not only does the movement engage the audience, but it also assists in expressing the feeling of turmoil. As in *Stress Vs Piece 1: Trepidation*, high-pitched sounds 'flutter' around the space, representing thoughts coming in and out of focus in one's mind.

2.2.3 *Stress Vs Piece 3: Perplexity*

The final piece of this trilogy, *Stress Vs Piece 3: Perplexity* uses sounds that are far removed from their original source recordings, though without losing the sounds' natural characteristics. The majority of the musical ideas and themes in this work – including the pace, the pitch and the movement of the sounds – are similar to those used in the previous two compositions.

The overall aim of this work was to express the idea confusion and uncertainty. One way I attempted to achieve this was to use sounds that were processed to the point where the original sound source was no longer recognisable, thereby reducing the possibility of sound associations being able to influence the listener's response. As in *Stress Vs Piece 2: Ambivalence*, frequency and pitch are important in creating the desired effect: high-pitched sounds are again used to evoke a feeling of unrest, and sustained sounds are placed in the background to build the feeling of tension and suspense. A high-pitched 'buzzing' sound is used to represent the rushing of blood through one's ears when

stressed. For example, in the section 5'43" to 6'21" the pitched 'buzzing' swells in and out of focus whilst different pitched variations overlap creating moments of dissonance.

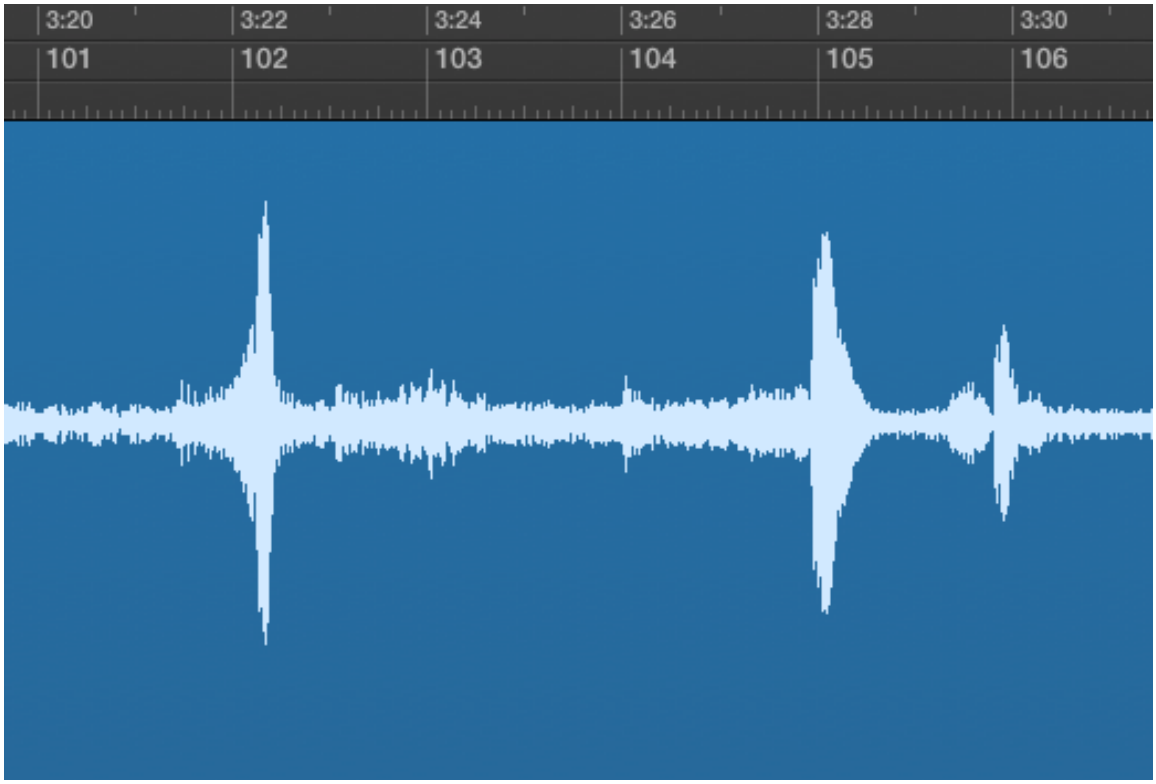


Figure 2.3: Screenshot using Logic Pro X for *Stress Vs Piece 3:Perplexity*

The development of ideas is interrupted on occasions by interjections of sounds that are unrelated to the previous sounds. At 3'22" a 'thud' sound suddenly changes the direction of the developing ideas with the focus shifting to an ambiguous, rhythmic 'shuffle' sound, before a second thud at 3'28" directs the focus back to the previous pitched, drone-like ideas (see figure 2.3). This is to create a feeling of frustration or shock, similar to the way that Daoust evokes such responses in *Anecdotes* (1979-89).

The pace of the music is steady but momentum increases when the music approaches

climactic points. This is again purposely done to express the idea of calm versus turmoil. An example of this can be heard starting at 4'22", when pitched variations of a repetitive 'murmur' sound are introduced one after the other, creating a layered effect and a thicker texture over a broader frequency spectrum.

The sounds used often sound like fragments of melodies or ideas that are then sporadically moved around the space. This idea aims to express the feelings of hopelessness and confusion.

2.3 *Stress Vs Piece*: Conclusion

The overall aim of the *Stress Vs Piece* trilogy was to be able to evoke specific emotions and feelings in the audience, though the success with which the pieces were able to do this varied greatly. As outlined in 2.1.4, there are many problems in evoking emotion through music and this became apparent when speaking to audiences after performances of the works.

What I learned from this was that the degree of success in evoking the intended emotion relied greatly on the audience members having the same schemas for the sounds as myself, implying that they would have to have had the same listening experiences as I have. This is almost impossible to achieve unless the audience was limited to a certain culture with similar background knowledge. I found that different listeners responded

and felt different emotions from what I had set out to evoke and – interestingly – they felt calm, rather than stressed. This could be because people enjoy, and also feel stressed about, different things; in addition, the strength of response to the same event can vary from person to person.

The success of these works also relied on creating a life-like and real situation/scene in order to evoke the same emotion as would have been felt in response to the comparable 'real' event. This was difficult because, as Frijda (1989, cited by North and Hargreaves 2008) highlights, the audience members are aware that they are listening to art, and that the event is not actually real (see 2.1.4). In the trilogy I used the sonic image of busy traffic in an attempt to evoke the feeling of stress, moving the sounds in space in a way that mimics 'real-world' behaviour. Despite my best efforts, however, listeners seem to remain aware that they are not, in truth, experiencing the real world.

Although the trilogy did not always succeed in evoking the desired emotions, I believe that these three works are nevertheless successful in that listeners seemed to enjoy them, and were able to grasp the basic general moods of the works. Stockhausen (2004) argues that the associations that we have with recognisable sounds can distract the listener and therefore make it difficult for them to appreciate the music and the sounds for their own aesthetic qualities. I believe that this could also be argued for broader themes such as "stress" and "peace". For example, can the title and programme notes for the pieces act as a distraction and even lead to a false positive, because listeners are aware of the

composer's intentions? Would the audience have the same response to the music if no title or background for the music were given?

CHAPTER 3

A CHILD'S SONIC FANTASY WORLD

(Inspired by my Godson Viktor Gabriel Rodrigues Rojas)

Following the experience of the *Stress Vs Piece* trilogy and having tried to understand the extent to which the influence of a listener's background knowledge and experiences impacts on the reception of the pieces, I then wondered whether a child would respond to music – and, indeed, the same piece – differently from an adult. I therefore decided to compose a series of pieces focussing on an impressionistic 'sonic fantasy world' inspired by the reactions of young children to sounds.

When visiting my Godson Viktor Gabriel, during his first year, I noticed that he responded to sounds very differently from the way I would expect an adult to react. An example of this was his facial expression of amazement and excitement as he attentively listened to the 'scrunching' sound of the paper that he was playfully contorting next to his ear. Another example would be when I observed him dancing on his bed to the sound of an electric drill. I continued to observe Viktor Gabriel and other children, noting how they responded to sounds with excitement and inquisitiveness. I also started to think about how children are more imaginative in developing narratives (playing 'make-believe') than adults and I wondered if this was because they have fewer inhibitions. The children had little associated learning or memory coding with the sounds and therefore they were exploring and responding to the sounds in ways different from adult responses.

I found these reactions interesting and I wanted to create an artistic impression of the thought processes occurring in children's minds.

In this chapter I will discuss my research into associated learning, which informs the compositional series, as well as providing a detailed account of the three works in the series.

3.1 Enculturation and associative learning

Enculturation is a process in which one develops associated cognitive learning according to one's environment – for example, a person regularly exposed to classical music would have more knowledge and understanding of the genre than someone who was not. The listener would start to make associations between the sounds that they hear and extrinsic/intrinsic musical meaning (see 2.1.3). By hearing multiple works in a given genre, listeners produce a schema that enables predictions to be made, based on past listening experience. Hargreaves and Castell (1987, cited by North and Hargreaves 2008) found that enculturation led to older generations being more familiar with a wider range of pieces and music styles. Their findings back up my theory that children have less associated learning than older people because they have less experience. Pasoulas (2011) also corroborates the theory by saying that 'recognisable sound events carry extra-musical associations that draw on listeners' experiences.' (Pasoulas, 2011, p.63) He also explains that the meaning (association) of the sound is usually a meaning agreed by

members of the same society; this links to the notion that the audience would need to have similar background knowledge to have the same associations with the sounds.

In the series my aim was to express an emotional and exciting world conjured in the child's mind. Smith (1987, cited by North and Hargreaves 2008) argues that a non-expert listener is more likely to respond to music with an emotional and referential approach, compared to an expert who would analyse the music. I believe this to be because the expert would have greater expectations and predictions for the music in which they specialise (or with which they are most familiar) compared to someone who is yet to make cognitive associations and have learned intrinsic musical meaning (see 2.1.1 outlining Kendall's mental layers (2014) and 2.1.3 referring to Meyer's theory of intrinsic musical meaning (1956)). I therefore tried to mirror the child's innocent exploration of sonic materials, which we can assume are made without predictions of expected outcomes, and my approach was accordingly less constrained by predetermined narrative concerns.

Despite their source of inspiration, this series of works is not aimed exclusively at a young audience; it is therefore important that these pieces do not rely on associative learning, unlike the works in the *Stress Vs Piece* trilogy. I want the listener to be in the same position as a child and to listen to the sounds purely for their sounding (and hence possibly musical) attributes (to echo Schaeffer's theory of reduced listening) and not for their possible associations to extra-musical meaning. My reading of Pasoulas (2011) suggested that I would therefore need to use sounds that are removed from their source

materials (for example, by processing) or expected context (for example, by juxtaposing sounds from different contexts/events) in order to enable the imagination of the listener to create their own context. The sound object's properties should be altered and changed to render the sound unrecognisable; Wishart (1996) describes this as 'dynamic morphology'.

3.2 Analysis of works in the series

As mentioned above, this series was inspired by and is dedicated to my Godson Viktor Gabriel Rodrigues Rojas. When visiting him I was able to observe the way in which a child responds to sounds with excitement and inquisitiveness. This series explores the sound worlds of different source materials and the way in which they develop and interact with each other along a journey into a sonic fantasy world.

The series was composed in the University of Birmingham Electroacoustic Music Studios, comprises three works: *Paperwork* (2012), *Kunchey* (2012) and *Crystal* (2013). The compositional challenges in this series were: to compose a coherent work using a maximum of two sound sources; to create an impressionistic sound-world relating to the responses or perceived responses of a child; and to immerse the listener in the sound-world using 8 channels.

For this series I used the 8-channel speaker configuration commonly referred to as the 'French' configuration (Wilson and Harrison (2010)), consisting of four stereo pairs without a speaker front-centre (as required for *Stress Vs Piece*). I chose this speaker layout because it forms the basis of the BEAST system, on which the pieces were to be originally performed (See Appendix 4 for the speaker layout/channel routing).

3.2.1 *Paperwork*

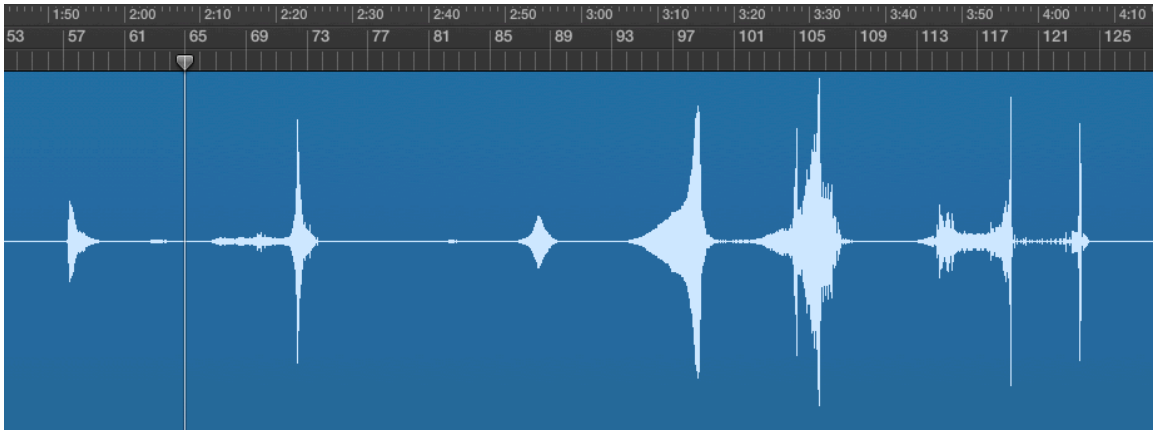


Figure 3.1: Screenshot using Logic Pro X for *Paperwork*

Paperwork explores both a world of sounds and movement in space. The challenge of this piece was to create a coherent composition using only sounds produced from a paper source or with 'paper-like' qualities (for example, I also used sounds recorded from the Dominican metal guiro that were then 'metamorphosed' with a paper sound by using SoundHack's convolution processing tool).

A feature of this work is the use of 'playful' gestures followed by silent pauses or a sudden reduction in the musical texture and the narrowing frequency bandwidth. For

example, at 2'22" a sound similar to a 'thunder crash' can be heard followed by a high pitched 'hiss' sound (see figure 3.1). This 'thunder crash' sound occurs frequently in the piece with a slight variation in pitch, reverberation and speed each time it is heard. These moments and events are intended to shock the listener and then allow time for them to process the event and imagine (or try to predict) what will happen next. This idea keeps the listener intrigued in a way that I hoped would be similar to that of a child when it is excited about something unexpected that might be about to happen. The large (loud) events or climaxes that are followed by silence are used as an attempt to tease the listener into a false belief that the music has finished. This idea was inspired by techniques frequentlyl found in classical music – the composer Felix Mendelssohn, for example, often used false endings to tease the listener, such as in the overture to *A Midsummer Night's Dream Overture* (1826), where he repeatedly uses plagal cadences followed by the whole orchestra repeatedly playing the tonic chord (a technique and cadence traditionally used as an ending device). However the music does not end at this point, instead it continues, with the real ending being heard later in the coda.

Throughout *Paperwork*, the creation and development of an exciting 'imaginary' world is reinforced by the erratic nature of the sounds' movements in space. My intention was to avoid predictability and therefore the movement had to be 'randomised'. An example of this would be the movement of the 'fluttering-clicking' idea that was created using an 8-channel filtering tool ("Filtr8" in BEASTtools) and randomising the rapid change of

volume for each channel. This strategy of moving the sounds around the space creates a lively soundscape that envelops the listener.

The 'lively' sounds and events are often contradicted by the slow, carefully paced ideas that develop in the background. The low-pitched drone evolves at a steady pace whilst the 'whisp' sounds come in and out of focus in the foreground. This idea is similar to the sudden interjections of sounds in the foreground in Pierre Henry's *Fissures* (from the album *Labyrinthe!* (2003)).

The sounds in *Paperwork* are continually morphing and developing, removing them more and more from their paper sources and their associated attributes. Emerging from the drones, there is also the use of 'wavelike' ideas that increase in momentum and intensity, drawing the listener deeper into the music. The wave effect reminds me of a similar idea in Henry's *Mer intérieure* (also from the album *Labyrinthe!* (2003)), where his use of drones and synthesised sounds produce 'wavelike' gestures.

3.2.2 *Kunchey*

Kunchey is the term used in Pakistan and northern India for both a game played with marbles and the word 'marbles' itself. I chose this title because the word relates to the source and the action, both of which are important in the composition.

Kunchey explores a world of sounds starting from one source then merging with another to create a serene setting. The challenge of this piece was to create a coherent composition using only two main source sounds, which in this piece are the sounds of marbles and a running bath. I chose these supposedly unconnected sources because after exploring the possibilities of the marble sounds, I discovered that the sound qualities were spectromorphologically similar to to certain 'water' sounds. I initially discovered the possibilities of marble sounds (particularly their interesting textural qualities) when composing the series *Stress vs Piece*, and wanted to focus on and explore this particular sound further.

Kunchey starts with the recognisable sound of a marble being rolled around, which is then rapidly metamorphosed into a new processed sound. This underlines the idea of moving from the 'real' world to the 'imaginary' world. The new sounds are heavily processed, although some of the spectromorphological qualities of the marble sound remain. By retaining certain qualities of the original sound I am able to create coherent, developing ideas whilst also being able to merge the sounds with others that have similar spectromorphological qualities. I therefore utilised these similarities to tease the listener into guessing whether the sounds are derived from marble recordings or bath recordings.

The similarities were emphasised through using filtering in the frequency domain and pitch shifting processing tools. The playful idea of teasing the listener is intended to echo the whimsical mind of a child playing and exploring without any preconceived notions of the likely outcomes.

The textures and rhythmical qualities of the sounds are the main focus in this work, and these influence the placement and movement of sounds around the sonic space. For example the 'sprightly' rhythmical sounds move at a faster pace than the drone-like sounds, which move at a slower pace (if they move at all). The movement of the 'swirling' water mimics the suggested movement in the sound itself, by moving around the space in a similar 'swirling' motion. Developing musical ideas from the spectromorphological qualities of individual sounds is a fundamental technique employed by acousmatic composers - for example Jonty Harrison in *Undertow* (2007) similarly 'swirls' the water sounds around the listener.

The 'frolicsome' gestures sound mainly in the foreground and are used to emphasise and highlight events in the music especially at climactic points. The background sounds are often introduced at a very low volume, then gradually develop and move to the foreground. For example the vocal 'moan' sound enters very subtly around 1'09" and then steadily increases in volume, but also develops through the introduction of higher-pitched versions of the same sound. This creates a thicker and more prominent texture that dominates the listener's attention.

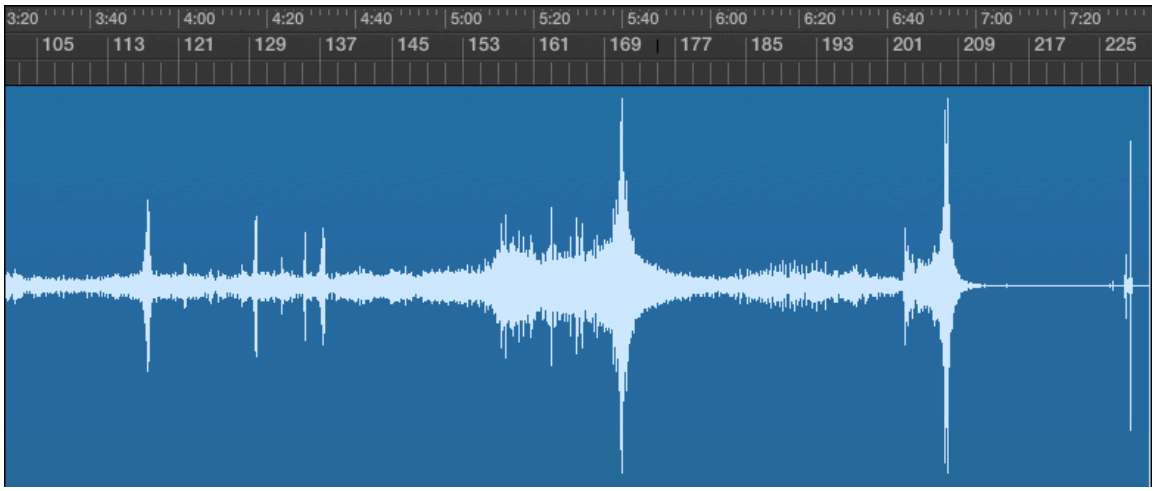


Figure 3.2: Screenshot using Logic Pro X for *Kunchey*

Through the use of pitch shifting, there are moments in the composition where there are tonal and harmonic developments of sounds. Tonality – or, at least, a remnant of it – is a prominent feature of this work, and is particularly evident in the production of a perfect cadence and major chord at 5'40". This cadence is used to create the feeling of release and comfort as we approach the coda (see figure 3.3).

3.2.3 *Crystal*

Crystal explores a world of sounds in continuous evolution, and ranges in mood from unrest to the more serene. Just three original sources were used: glass (tapped and smashed), aluminium foil and female voice. The challenge of this piece was to create a coherent composition using only three types of source sounds.

Crystal is the final piece in this series and contains many musical attributes similar to ideas found in the other two works. For example the movement of the foil sounds mimics the style of movement of the paper sounds in *Paperwork*, and the tonal focus is similar to that in *Kunchey*. I found these ideas to be successful at evoking positive responses, presumably resulting from a sense of 'familiarity' within a predominantly more abstract context. According to verbal feedback after the first performance of the work, the movement of the sounds intrigued the listeners and the tonal developments evoked emotive responses. Likewise, the build in tension resulting from increasing the thickness of texture and widening the frequency spectrum echoes techniques used in the previous two works.

In this work I believe that the 'imaginary' world is epitomised by the use of heavily processed sounds that are far removed from their recognisable sources. The extraction of the 'recognisable' allows for the listener to enjoy the sounds without the inhibitions of source-bonding (a term defined by Smalley (1997) as the natural tendency to relate a sound to a possible source). Pasoulas suggests that by removing the explicit meaning of the sounds, "… the listener may focus on the spectromorphological characteristics of sound…" (Pasoulas, 2011, p.66). This is of importance in *Crystal* because the aim is to 'enjoy' the sounds and their qualities without any influence or implication of 'meaning' – once again aiming to echo a child's naïve response. In Schaeffer's *Etude aux chemnis de fer* (1948) the listener is also encouraged to explore the sound world through reduced listening, and enjoy the rhythmic and sonic qualities of the sounds. However, the

limitations of sound processing at the time means that the sound sources remain recognisable to a much greater degree than in *Crystal*.

The initial gesture of *Crystal* is that of glass being smashed, representing a glass mirror being broken and thus opening into the 'imaginary' world. This idea was inspired by Lewis Carroll's novel *Through the Looking Glass, and What Alice Found There* (1871). This idea is exaggerated by the 'heavy' reverberation effect on the sound, which also suggests a large open space. The sound gradually fades away as rhythmical, pitched 'crunchy' sounds slowly crescendo into the foreground of the piece. This crescendo is assisted by repeated the introduction of pitched variations of the sound resulting in a thick and 'energetic' texture. At 0'55'' a sound enters that simulates the sound of a ringing bell (possibly on a boat). This sound has almost a melodic quality and is repeated as it drifts in and out of focus. The introduction of this sound is start of the first climactic point of the piece. This is emphasised by the now more rapid overall crescendo and the broadening of the frequency spectrum, for example the introduction of the high pitched 'whistle' sounds that echo the sounds of fast winds. At 1'11'' a loud tonal bell-like sound created from the editing and processing of a recording of a glass being tapped, is used to signal a false ending to the opening section. The sounds suddenly drop in volume on the sound of the bell, but then they quickly rise again until they are interrupted by a variation of the bell sound; this second bell sound is the signal for the end of the opening section. I chose to include a false ending in order to reinforce the aim of creating a playful attitude.

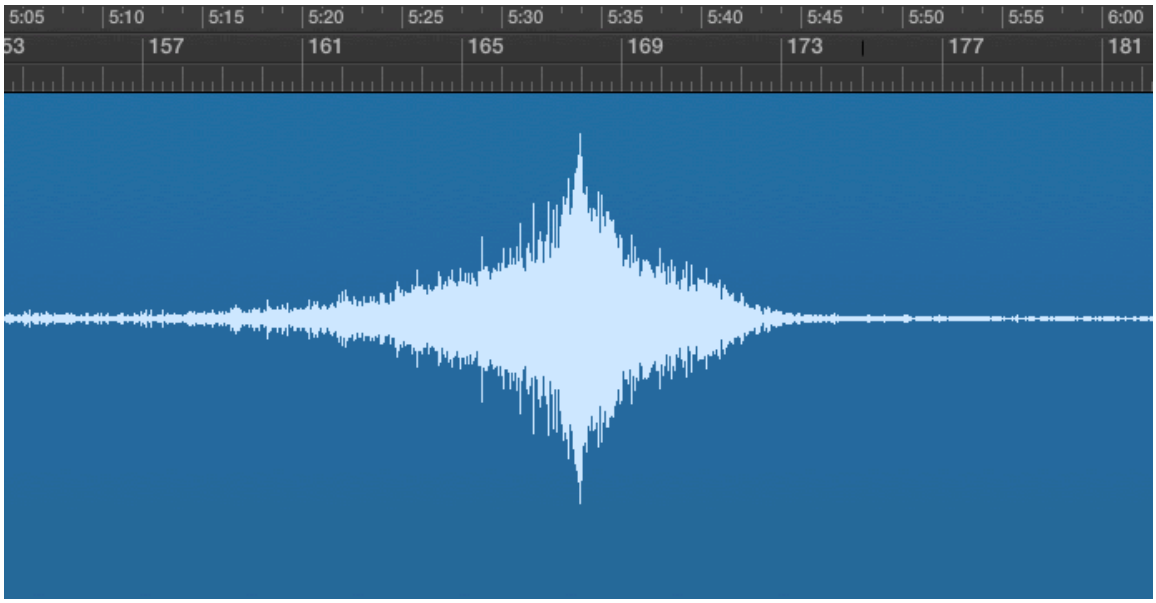


Figure 3.3: Screenshot using Logic Pro X for *Crystal*

Throughout the piece there are peaks and troughs as developing ideas come in and out of focus. This was a deliberate attempt at reflecting the way in which a child's focus can rapidly shift between different ideas. These peaks and troughs were also used as a compositional tool to develop ideas gradually and to introduce new sounds and sections of the piece. An example of this would be when the large peak at 5'33" (a loud thunder-like sound which is pre-empted by a rapid, upward frequency sweep) introduces a new idea, formed by a low-pitched, vocal sound, which then comes into focus from the background as the thunder crash sound dissolves (see figure 3.3). This low vocal sound was created through the use of extreme time stretching of a female singing voice.

The tonal sections in this work were intended to create tension and comfort through the use of dissonance and consonance. The sustained vocal sound entering after the thunder

crash insinuates the idea of a tonic. The pitch of the sound gradually shifts whilst overlapping, differently pitched versions of the sound are introduced. At 6'19" the interval of a major third is introduced followed by the fifth, creating a broken chord (arpeggio) effect. Here the music sounds consonant, reinforced by duplicates at the octave, and therefore sounds calm. However the discordant introduction of the interval of a major second at 6'45" starts to create tension and unrest, but is quickly rectified by the perfect cadence subtly starting at 6'56". This cadence is not only an example of how I used tonality to aid the structuring of my pieces, but also it is another example of where I have used a 'playful' false ending. After the cadence, neither the piece nor the section ends; instead the 'fluttering' tinfoil and the low-pitched vocal murmurs heard before the cadence continue until the real end of the section. This is signalled by the sustained tonic chord which gradually fades in from 8'15" whilst the tinfoil sounds 'fizzle' away. At 8'40" the tonality changes to minor.

3.3 Conclusion of the series

Overall, I believe that these works are successful at portraying the 'sonic fantasy world' of a child. The sounds were removed from the expected with regards to form and movement, allowing for the listener's imagination to take control in what I believed would be the same way in which a child would receive them. Stockhausen (2004) argued that by rendering sounds unrecognisable, listeners would no longer be distracted by the sound-image associations and would therefore allow the imagination the freedom to

create a new autonomy of the sound world presented to them. Although some sound sources remain recognisable in the works, in my opinion these do not distract the listener from the overall 'playfulness' of the developing sound world and therefore allow the listener's imagination to be free to explore.

I also believe that the pieces were successful in taking the listener on an emotional journey which was often guided by the changes in harmony and tonality. In my opinion these harmonic moments were not only able to influence the changes in emotion and mood, but also were pleasurable to hear because they have qualities that are familiar to those found in classical music, with which many listeners (including myself) are familiar.

CHAPTER 4

WEAVER

Figure 4.1: Author's photograph of Styal Mill, Cheshire.

Weaver was commissioned by an anonymous donor via the University of Birmingham *Circles of Influence* campaign.

Weaver uses sounds recorded from the River Weaver and Styal Mill/Quarry Bank Mill, a former cotton mill in Cheshire. The mill was once powered by water and, throughout the piece, there are numerous sonic references to water and its behaviours. The water sounds weave through time as the machines evolve from small hand-machines to the larger water-powered machinery of the mill. The piece concludes in a tranquil 'present' to

express the now silent, unused mill. The piece was written to reflect the industrial era in Cheshire, inspired by the 2012 London Olympic opening ceremony.

Weaver was realised at the new Electroacoustic Music Studios at the University of Birmingham, opened in 2013 as part of the Bramall Music Building, using Nuendo and GRMtools. Most of the sounds for *Weaver* were recorded onsite at the River Weaver and Styal Mill, though some material was recorded in the Studios. The studio-recorded sounds were used to emphasize specific moments and gestures in the composition that were unable to be produced from the environmental recordings. For example, the sound of the mill bell was in fact recorded in the studio using a small hand bell that was later processed with pitch-shifting and reverberation to create the impression of a larger bell in an open environment (this can be heard at 12'00"). In general, the processing of the sounds was kept to a minimum; my intention was to maintain recognisable spectromorphological qualities because I wanted to evoke specific extrinsic musical meanings and associations related to the narrative (see 2.1.3 regarding extrinsic musical meaning).

Unlike the other pieces in the portfolio, *Weaver* is a stereo work and not 8-channel This was a deliberate choice – not only because stereo remains the most commonly used format for acousmatic music and, I believe, allows more possibilities when diffusing the work in concert, but also because it enabled me to work with and emphasise the original stereo image of the machinery as recorded. For me, the impact of diffused stereo is

completely different from an 8-channel image and I feel it can, ironically, be even more 'immersive' in character. This was of particular importance when portraying the oppressive sounds of the large, loud machinery, which I felt should not be moved around the performance space, as these huge machines are unable to move. It seemed to me that having such material move around in space would disturb the association and effect of 'reality'. In diffusion, I placed this material in several stereo pairs from within the loudspeaker array. Annie Mahtani's programmatic work *Past Links* (2008), an 8-channel composition in which the narrative similarly focuses on a bygone era, includes the sounds of large machines which, similarly, do not move around the space; this idea influenced the static deployment of similar machine sounds in *Weaver*.

The composition focuses on the changing soundscape of an environment. It starts with the more peaceful and less inhibiting sounds, before evolving into the loud oppressive factory sounds that drastically changed the sound environment. As R. Murray Schafer (1973) discusses, in relation to the industrial revolution, the way in which the sounds of nature are taken over by the sounds of industrial life.

Weaver follows a narrative approach that leads the listener through time, from the past to the present. The narrative focuses on the development of technique and machinery for the processing and weaving of cotton. Pasoulas (2011) suggests that a chronological order in a composition can lead the listener to make links between successive sound events and generate a narrative through development and interrelations. Similarly,

reintroducing events and sounds expresses the idea of reminiscence and can disrupt or rearrange the narrative. Disrupting the narrative can shock or excite the listener, and the resulting unpredictability ensures that the listener remains attentive to the music. In *Weaver*, variations of the river sounds are repeatedly reintroduced between sections; this is not only to disrupt the narrative, but also to emphasise the continuity of the existence of the river despite the changes around it. Pasoulas (2011) explains how sounds can allude to a particular sense of duration; and Schafer (1997) describes another 'water' sound, that of the sea, as being symbolic of eternity.

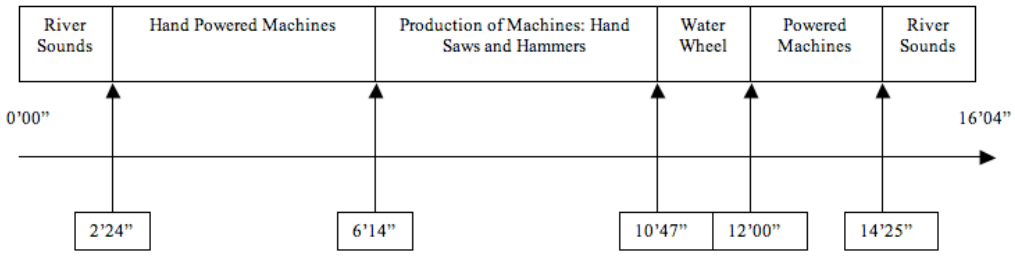


Figure 4.2: Structural Diagram of *Weaver*

Weaver starts and finishes with sounds recorded from the River Weaver in Cheshire. At 2'24" the listener is first introduced to the sounds of machinery in the form of a hand-wheel. I found this 'creaking' sound to be very interesting in terms of textural and tonal qualities. I then developed ideas with this sound to create the 'Hand Powered' section with the inclusion of another hand-powered weaving machine. The following section was composed to reference the building of new machinery and is produced from the use of handsaw and hammer sounds. At 10'47" the saw sounds reach a climax, giving way to the sounds of rushing water and the 'thunderous' water wheel. The ringing bell heard

at 12'00" represents the factory bell calling the workers to start their shift. This is then followed by the developing sounds of the large, now powered machinery.

Figure 4.3: Author's photograph of machinery once used at Styal Mill

During the compositional process of *Weaver*, I introduced the sounds I was using to children at two different secondary schools. The children were aged between 11 and 16 with varied musical ability and understanding. I encouraged the pupils to compose their own electroacoustic compositions to their own narrative. Many pupils chose a superhero theme, some focussed on the sound-effect qualities of the material, whilst others created lively rhythms (commonly referred to as 'beats' by the children). Although electroacoustic music was new to the pupils, they engaged with the activity extremely well and rarely questioned the genre as music. I believe this was because the children had fewer inhibitions about what to expect from music (as discussed in 3.1). I later

played excerpts of *Weaver* to the pupils and questioned them on the narrative or sonic images they associated with the piece. In general, the pupils responded with narratives that related more to recent 'robot' films or to situations that they had experienced. It became apparent that the pupils were unaware of the industrial revolution and therefore would not have made the association if not explained beforehand. When performing the piece to an older audience, the understanding of the narrative had greater success, although one could argue, as discussed earlier in 2.3, that the audience members were aware of the narrative because they had previously read the programme notes.

Wil Bolton's *Quarry Bank* (2011), Diana Salazar's *Spindlesongs* (2008), and David Berezan's *Styal* (2004) are other electroacoustic pieces based on sounds recorded at Styal Mill. I was aware of the existence of these works before composing *Weaver*, although I believed it was important not to listen to them until after I had finished my own piece, as I did not want to be influenced by any of the ideas that the other composers had used. After listening to the above works, however, I was happy to find that *Weaver* was quite different in style. For me the other compositions focus more on the spectromorphological qualities of the sounds (like the works in my previous series), whereas in *Weaver* the narrative and overall aesthetic of the composition is of more importance (though, of course, this could arguably be a result of my knowing what that narrative is intended to be).

In conclusion, I believe that *Weaver* is one of the more successful works in this portfolio and it also received the most positive feedback. The narrative works well in the piece, but the listener can also enjoy the sounds for their spectromorphological qualities.

CHAPTER 5

CONCLUSION

Throughout my PhD I found myself developing as a composer and researcher. I started to consider the overall aesthetic of the composition and the ways that the sounds used related to one another. I developed techniques of emphasising sound events through methods such as changing the overall frequency bandwidth, panning and the addition of 'gestural' sounds. I also started to consider, to a much greater extent than I had previously, the way in which sounds move in space, and how this can influence the listener.

The initial aim of my research was to investigate how successfully emotion could be evoked in electroacoustic music, and I found that, to a certain extent, traditional methods, such as the use of modes, keys and 'Mickey-Mousing', could be adapted and applied with some success. In general I believe that my compositions were successful in evoking emotions, although the results were not always consistent. It became apparent that the music had different meanings and connotations for different people, which I believe to be because of the issues outlined in chapter 2.1.4 – no two people will have the exact same background knowledge, associations and understanding. However I found that the success of evoking the specific desired emotion, did not necessarily adversely affect the listener's enjoyment of the work. Through a gradual learning process, fuelled by personal reflection and the informal feedback from audience members, the focus for my

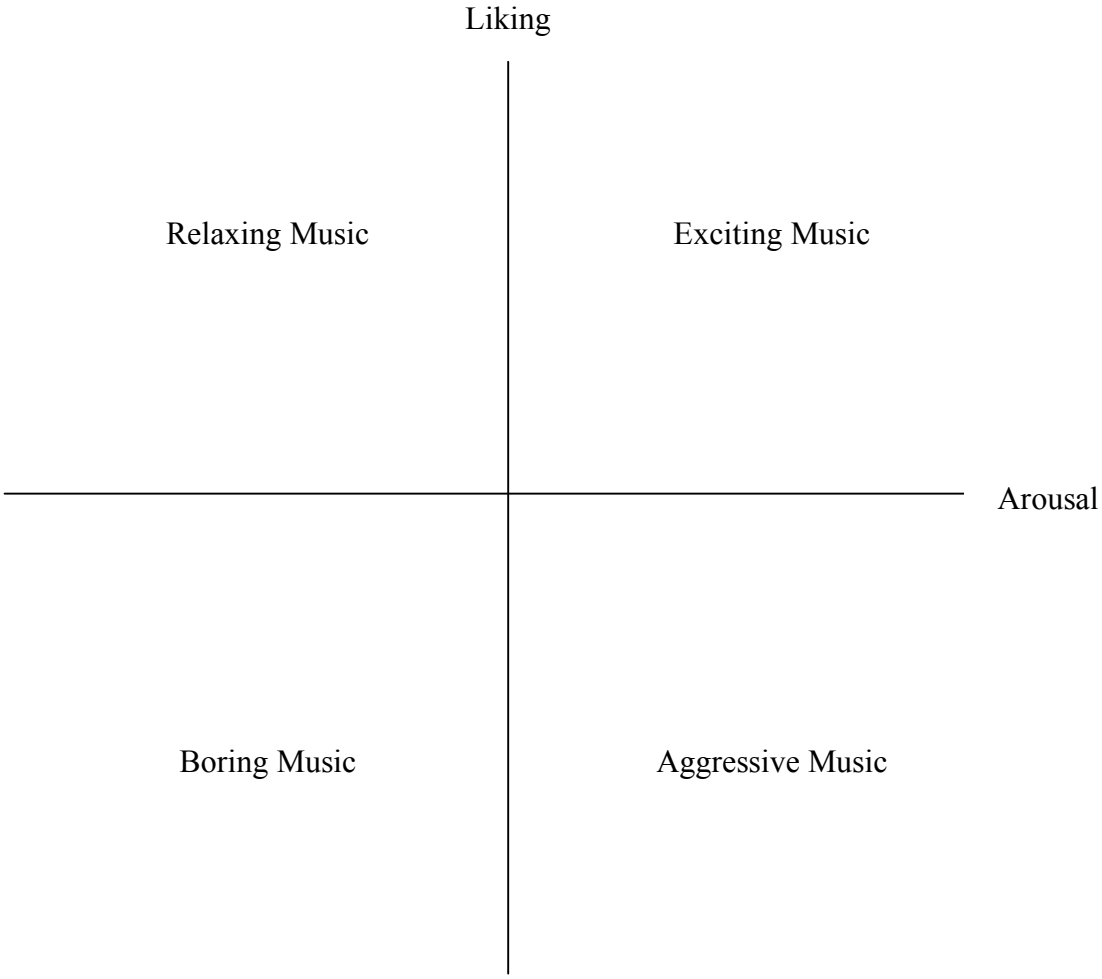
works moved away from a linear narrative and more towards an overall theme or mood. During the compositional process I found that I no longer required a predetermined narrative to form the structure of the work and instead I was able to create forms focussing on the considered development of sound and tonal qualities. My intentions gradually changed from hoping that the audience would feel specific emotions at precise moments, to wanting to create an overall journey at the end of which the listener would feel emotionally different. I wanted to compose pieces that the audience could enjoy without the need of prior information (e.g. programme notes), which I believed could lead to preconceived ideas distracting from the listener's possible enjoyment. Gradually my aim developed into wanting to compose works using imaginative and creative developments of sounds, gestures, and the interjections of tonal ideas and climactic cadences that would be pleasurable to hear.

During my final years at the University of Birmingham, I joined the laptop ensemble BEER (Birmingham Ensemble for Electroacoustic Research) where I learned about live coding and performing live electronics using SuperCollider. Although I did not compose works for the ensemble, I believe that by performing with them I broadened my knowledge and understanding of electroacoustic music, enabling me to start to consider how emotion and meaning could be expressed in a live electronic work.

APPENDIX 1:

The Rickard Two-Dimensional Approach to Conceptualising Emotion

(adapted from North and Hargreaves 2008, 129)



APPENDIX 2:

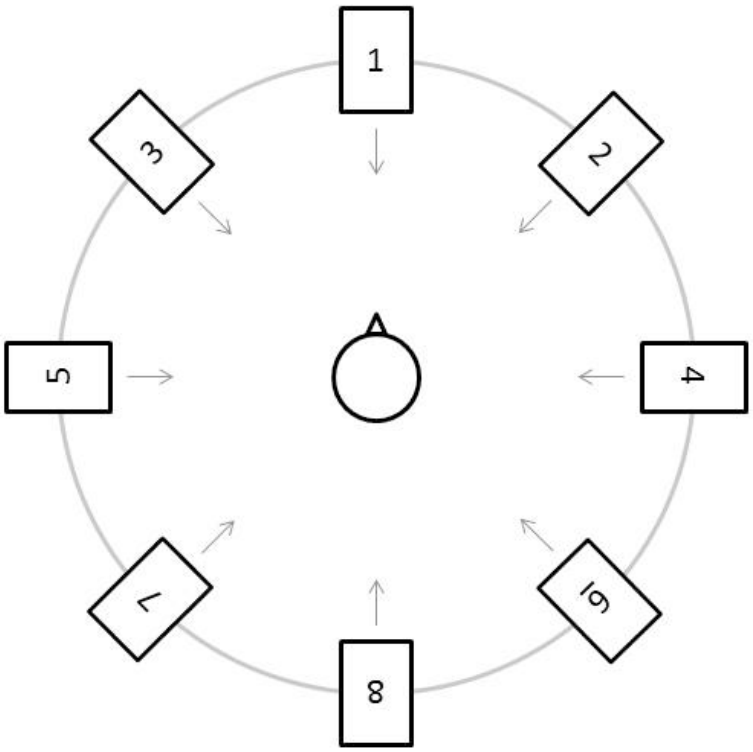
The Hevner Adjective Circle
(adapted from North and Hargreaves 2008, 131)

APPENDIX 3:

Diagram of 8-channel speaker array (1)

Diagram of the speaker configuration and layout referred to as an 'Double Diamond' array (Wilson and Harrison, 2010) in the BEAST studios.

This arrangement is used for the *Stress Vs Piece* trilogy.

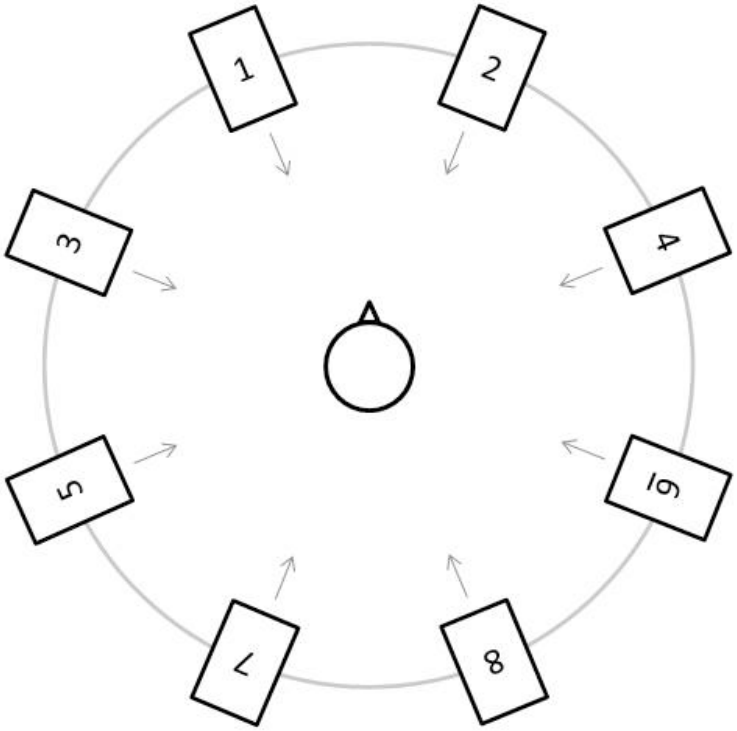


APPENDIX 4:

Diagram of 8-channel speaker array (2)

Diagram of the speaker configuration and layout referred to as a 'French Configuration' (Wilson and Harrison, 2010) in the BEAST studios.

This arrangement is used for the following compositions: *Paperwork*, *Kunchey*, and *Crystal*.



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