A new sound mixing framework for enhanced emotive sound design within contemporary moving-picture audio production and post-production.

Volume 1 of 3

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Abstract

This study comprises of an investigation into the relationship between the creative process of mixing moving-picture soundtracks and the emotions elicited by the final film.

As research shows that listeners are able to infer a speaker's emotion from auditory cues, independently from the meaning of the words uttered, it is possible that moving-picture soundtracks may be designed in such a way as to intentionally influence the emotional state and attitude of its listening-viewers, independently from the story and visuals of the film. This study sets out to determine whether certain aspects of audience emotions can be enhanced through specific ways of mix-balancing the soundtrack of a moving-picture production, primarily to intensify the viewing experience.

Central to this thesis is the proposal that within a film soundtrack there are four distinct 'sound areas', described as the Narrative, Abstract, Temporal and Spatial; and these form a useful framework for both the consideration and the creation of emotional sound design.

This research work evaluates to what extent the exploration of the Narrative, Abstract, Temporal and Spatial sound areas offers a new and useful framework for academics to better understand, and more easily communicate, emotive sound design theory and analysis; whilst providing practitioners with a framework to explore a new sound design approach within the bounds of contemporary workflow and methodology, to encourage an enhanced emotional engagement by the audience to the soundtrack.

By analysing the work of sound theorists and practitioners, developing a new sound design framework and critically reflecting on personal creative practice, this research suggests that different ways of balancing a soundtrack can influence an audience's emotional response to a film; and that the proposed Four Sound Areas framework is a useful way to look at the soundtrack when approaching a mix from the point of view of its emotional outcome.

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A part-time, self-funded PhD is by its nature intrinsically a solo pursuit; and not unlike (in my imagination at least), a single-handed circumnavigation of the globe in a yacht. But as with such an endeavour, notwithstanding the personal commitment to finish what was started and ride out the daunting and dispiriting Southern Ocean of self-doubt, an undertaking of this sort would be utterly impossible without the help of others. I must therefore thank - profusely - those special people.

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Finally, my underpinning motivation for this PhD by Practice is undoubtedly rooted in a life-long love of cinema, which later developed into a fascination (bordering on obsession) for the sound that accompanies the pictures.

As a direct result of this PhD, I have been privileged to meet (and been allowed to discuss at length) my thoughts on moving-picture sound design with such luminaries as Walter Murch, Gary Rydstrom, Randy Thom, Eddy Joseph, Michael Hedges and David Macmillan. Together, they form a collective of talent, wisdom and experience that has amassed a total of 17 Oscar wins, 33 Oscar nominations and a further 33 BAFTA wins and nominations for their work on feature film sound design and mixing. Their generosity in both listening and then corresponding further to continue our discussions, reinforces them to me as cinema ‘greats’ in every sense of the word; and I offer my deepest personal

and professional respect and grateful thanks for their input, influence and above all else, their inspiration.

Author's Declaration.

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

Publications arising from this thesis are:

i) Hillman, N. (2014), *Organic and free-range Sound Design,* in The New Soundtrack, Volume 4.2, pp. 123-138.

ii) Hillman, N. & Pauletto, S. (2015), *The Craftsman: The use of sound design to elicit emotions,* in The Soundtrack, Volume 7.1, pp. 5–23.

iii) Hillman, N & Pauletto, S. (2016), *Audio Imagineering: Utilising the Four Sound Areas Framework for Emotive Sound Design within Contemporary Audio Post-production*, in The New Soundtrack, Volume 6.1, pp. 77–107

iv) Hillman, N. (2018), *Foundations in Sound Design - Post-Production II. The Mix Stems: Voice, Effects, Music.* (Chapter), London: Routledge.

1 Introduction

1.1 **Introduction**

This practice-based research investigates and presents an approach to sound design by which a Sound Designer may consider structuring a soundtrack, and a Re-recording Mixer may consider emphasising certain elements of that soundtrack, to steer and intensify the intended emotional experience for listening-viewers.

Central to this process is the proposal that all moving-picture soundtracks, such as those for filmed entertainment or broadcast television, are created from an audio 'compound' made up of four distinct elements, termed the *Narrative*, *Abstract, Temporal* and *Spatial* sound areas; and that these areas form a useful framework for both the consideration and the creation of emotional sound design.

The *Narrative* Sound area is concerned with sound that carries direct communication and meaning. Dialogue and commentary are the most important examples of this area, which also includes symbolic and signaling sounds such as ring-tones, sirens, and other sounds; and also music with a clearly defined meaning.

The *Abstract* Sound area is concerned with sounds that have a less codified and clear meaning. Atmospheres, backgrounds, room tones, sound effects and music are examples of these.

The *Temporal* Sound area is concerned with the evolution in time of the sound design. Its characteristics are rhythm, pace and punctuation. This area can include music, sound effects and voice.

The *Spatial* Sound area is concerned with the positioning of sounds within a three-dimensional soundfield and the space placed around the presented sound. Greater detail regarding these Four Sound Areas is contained in Chapter 5 of this thesis.

Gary Rydstrom, a renown Sound Designer and Re-recording Mixer at Skywalker Sound, considers his role to be:

> […] someone who the Director turns to as being in charge of the soundtrack. (Loewinger, 1998)

With this in mind, this study suggests that it is the job of the Sound Designer and the Re-recording Mixer (often, but not always, the same person) to understand, create and manipulate the inter-relationship of the proposed Four Sound Areas of this research: the Sound Designer presenting a *selection of sounds* considered capable of creating emotional impact, whilst the Re-recording Mixer determines *the relative balance* of these sounds (i.e. the emphasis given to each of the Four Sound Areas within the mix at any one time), to elicit, emphasise or steer the emotional responses of the listening-viewer.

It is also worth defining at the outset the areas of 'ring-fenced' autonomous creative practice that exists for a Sound Designer and Re-recording Mixer; as well as the similarities and differences in the responsibilities and objectives of these two different roles. The first similarity and overriding purpose of both jobs is to best serve a film's artistic and technical potential; but how they go about achieving this is somewhat different.

The Sound Designer first identifies the 'extra' sounds that are required to augment or replace the supplied production sound (supplied by the Production Mixer, usually via the picture editing department) which normally consists of only the dialogue recorded on location; and then looks to present the Re-recording Mixer with all and every sound element that they have interpreted and consider to be of plot, storyline or emotional significance to a particular scene.

Tarkovsky notes:

> As soon as the sounds of the visible world, reflected by the screen, are removed from it, or that world is filled, for the sake of the image, with extraneous sounds that don't exist literally, or if the real sounds are distorted so that they no longer correspond

> with the image— then the film acquires a resonance. (Tarkovsky 1987, p162)

Typically, the Sound Designer's output comprises dialogue, atmospheres, sound effects, Foley and score; and they may also synthesize and manipulate sounds to create new, unique sound effects. In a word, the Sound Designer is committed to providing aural *content*. The Sound Designer's position in the sound team is highly creative and autonomous, but also carries significant responsibility for managing the audio post-production team and processes.

The Re-recording Mixer has to sort through the myriad supplied audio, which by this stage consists of Dialogue, ADR (Automated Dialogue Replacement), Foley, Sound Effects, Atmospheres and Music. They need to understand the intention and motive for each element of the presented soundtrack, determining, enhancing and controlling the tonal quality, sonic fidelity and volume level of the individual audio clips, whilst providing objectivity as to what should be included or discarded to best serve the emotional needs of the movie. This rationalization is an essential, creative process; Tarkovsky comments again:

> The sounds of the world reproduced naturalistically in cinema are impossible to imagine: there would be a cacophony. Everything that appeared on the screen would have to be heard on the soundtrack, and the result would amount to sound not being treated at all in the film. If there is no selection then the film is tantamount to silent since it has no sound expression of its own. (Ibid.)

A Re-recording Mixer is required to work quickly, accurately and to a high standard. In short, the Re-recording Mixer is committed to providing the *context* for the Sound Designer's *content*. A Re-recording Mixer requires a great deal of manual dexterity, as well as craft skills, technical knowledge and emotional sensitivity. The role offers a great deal of creative freedom, but it also carries total responsibility for the nature and quality of the final soundtrack.

With regard to the creative freedom bestowed onto both the Sound Designer and the Re-recording Mixer, Deutsch observes:

> […] in practice it's common that a considerable amount of sound post-production (effects creation, dialogue replacement, track-laying, processing, pre-mixing, etc.) is done away from the Director's oversight, and is a reflection of the distinctive craft and creativity of the sound department. (Deutsch, 2018)

The full extent of this creative freedom away from the Director's eyes (and ears) is worth stating; and is made manifest by the amount of work that has to be carried out to get the sound stems into a ready-to-be-mixed (or pre-mixed) state. Whilst a modern Digital Audio Workstation (DAW) bestows great flexibility for the manipulation of sound clips, there are still routinely up to 14 decisions a sound editor must make for every audio clip on the timeline; e.g:

1 - Open head of clip
2 - Open tail of clip
3 - Shorten head of clip
4 - Shorten tail of clip
5 - Fade-in clip
6 - Fade out clip
7 - Increase or decrease clip-based gain
8 - Cut within the clip (then repeat all of the above)
9 - Crossfade between clips
10 - Pan
11 - Apply clip-based EQ
12 - Apply clip-based Reverb
13 - Remove location room Reverb
14 - De-noise.

Given that the audio 'clip-count' is now so high in modern movie production, the 'clip tally' makes interesting reading: a 20 minute reel can easily accommodate 3,000 audio clips. With 14 decisions required per clip, each 20 minute reel can contain in the region of 42,000 decisions. An average feature

film of 100 minutes has five reels; therefore 3,000 clips, each requiring 14 decisions, across 5 reels, can result in around 210,000 creative decisions being made - in the absence of the Director – even before the mix.[1]

This investigation considers and explores all the key components of sound design (i.e. voice, sound effects, atmospheres and music) and several different recording, processing and reproduction techniques. As a practice-based work, it contributes to a wider understanding of the role a Sound Designer and Re-recording Mixer can play in evoking emotional responses in a moving-picture audience, whilst satisfying the dramatic and narrative needs of the film.

On the concluding nature that sound often occupies in the film post-production process, Sider notes:

> Meanwhile, sound in film remains, as it has for decades, a more or less technical exercise tacked on to the end of post-production. (Sider 2003, p.5)

It's generally during the final mixing stage – the commitment of aural artistic intent and usually the last creative production process in the arc of producing a feature film – that the creative work of the Sound Designer and Re-recording Mixer first comes under scrutiny from the film's Director, as well as other stakeholders; all of whom are engaged earnestly in the endeavour of delivering a finished product to the movie's distributor by a specified date.

Walter Murch, for whom many accredit the original title and use of the term *Sound Designer* (Sider, 2003) describes his *modus operandi* as being to:

> […] balance the original dreams of the Director, the needs of the studio, my own hunches about things, and the voices of everyone else working on the film. (Loewinger, 1998)

[1] This possibly understates the old Re-recording Mixer's adage of 'I need to make 100 decisions so the Director only has to make 1'.

In an expensive-by-the-hour audio post-production mixing theatre, time, tempers and patience can run short; and this can be less than conducive to making creative decisions. What can make this an even more dispiriting destination to arrive at is that the sound department's capabilities to support and enhance a film's vision, aspirations or storyline - through the medium of the soundtrack - is often painfully misunderstood.

As Sider observes:

> Whether it is credited as 'Sound Design' or 'Sound Editing', sound for film is still largely considered a technical domain only fully understood by a film's sound department. Young film-makers adopt this attitude early in their training in film-production classes. Rarely is sound included in theoretical analyses of dramas or documentaries. Possibly because of its omnipresence, sound is rarely considered in film pre-production. (Sider 2003, p.7)

In an attempt to populate a dialogue that is useful for both academics and practitioners, this practice-based research looks to describe and understand to what extent the work of a Sound Designer and a Re-recording Mixer can evoke or enhance emotion in an audience, explicitly through the balancing of a soundtrack's mix; looks at ways in which a Sound Designer and a Re-recording Mixer's expertise and underpinning knowledge might be developed or extended, to understand what emotions they might reasonably be able to induce by means of the soundtrack composition and emphasis; and offers a new way for film creatives to communicate emotional intent for a soundtrack, through the theoretical concept of the Four Sound Areas.

Overall, this research is an exploration of – and a journey into – *the act of mixing*, it is not specifically about the type of content that is being mixed; and what underpins this PhD by Creative Practice is that as a practitioner, the world of the Sound Designer and Re-recording Mixer is the departure point for the author to begin this investigation.

The *Age of Airplanes* alternative mixes, supplied on the accompanying material, shows the effect of different mix-balances on the listening experience.

1.2 Research outputs and thesis structure

The outputs of this PhD by Creative Practice comprise: a **portfolio of creative works** which constitute the main output of this research; a **professional portfolio** providing a record of the author's intellectual and creative progress, along with professional development undertaken over the period of this research; and a **thesis** with a maximum word limit of 45,000 words.

The **creative portfolio** items are all original work, created by the author within professional production and post-production environments, and all utilise the Four Sound Areas framework for emotive sound design as proposed in this thesis.

The creative works contained in the portfolio were produced for commercial purposes and the theatrical release dates of the feature films are given in Appendix 1.

The **thesis** first introduces the research questions that were explored; it then goes on to consider relevant and supporting works in a literature review; it presents the overall research methodology; it describes the sound design framework proposed, and details the framework in practice as used on two commercially-released feature films and a live Outside Broadcast production; it offers a critical analysis from this work; and ends with the conclusions drawn and suggestions of possible further work.

This thesis contains both reflection and analysis of the portfolio pieces and original scholarship is primarily demonstrated in Chapters 4 to 8.

The specific term 'listening-viewer' is used throughout this work when referring to the intended audience of a soundtrack, to differentiate from the more general and widespread media use of the terms 'viewer' and 'listener'.

The **professional portfolio** provides a record of the author's professional and academic development during the period of this research. It includes records of academic training, industry training, teaching appointments and commissioned work.

Based on the research undertaken and the examples created during this investigation, and also by analysing and evaluating the work of other academics and moving picture sound designers, the body of work presented in this doctoral research contributes to the emerging field of study on the relationship between Sounds and Emotions (e.g. see Gerrig 1996; Holland 2009; Juslin & Sloboda 2010); and demonstrates novel production methods, new sound design strategies and a contribution to existing sound design research themes.

2 Research Questions

2.1 Research questions

The research questions that this investigation has set out to answer are:

> Can the emotional impact of a film scene be affected by balancing a soundtrack's sound design elements in specific ways?

The word "balancing" in this study refers to the "level balance", or "mix balance", between the different soundtrack discrete elements that constitute the compound of a moving picture soundtrack; the manipulation of which is under the complete control of the Re-recording Mixer.

Furthermore this research asks:

> Can a practical framework be developed to facilitate the enhancement of specific emotions in an audience via the mix-balancing of sound design elements by the Re-recording Mixer?

These questions will be investigated by:

- Exploring available professional and academic literature in the field on emotions and sound design
- Reflection on own past and current practice
- Theorisation of framework for sound design and emotion to be used both in practice and to support analysis of other works
- The creation of a portfolio of works that use the framework
- Bringing together the new understandings acquired in this study to reflect on the applicability, limitations and scope of the proposed framework, and finally reflect on how this work answers the original research questions

3 Literature Review

3.0 Chapter introduction

This chapter reviews professional and academic literature relevant to this research and this includes clarifying the terminology used, discussing to what extent the areas of music and emotions, and speech and emotions are relevant to this study, and reviewing existing sound-related frameworks.

3.1 Defining the nature of Emotions

The initial motivation for this PhD by Practice came from a professional interest in investigating quite what the “emotional” element of an audience’s reaction to moving picture sound design and soundtrack balancing might be; and then, if it was possible to shed light on what that is, to look at whether reproducible techniques might be employed by fellow Sound Designers and Re-recording Mixers to elicit target emotions in an audience.

Clearly audiences do have emotional reactions to movie soundtracks - there are obvious, outward signs when a film makes an audience laugh out loud in a theatre, or even cry; and many people will have first-hand experience of what it is to feel happy, fearful or uncomfortable whilst watching and listening to a film.

However, after reading work relevant to this investigation, it soon became apparent that it was important to determine whether the response of an audience to soundtrack stimuli could be described consistently; because there appears to be in literature a distinct commingling of the terms audience *emotion* and audience *affect*. In seeking an answer to the question of which is the most appropriate term between *emotion* and *affect*, there appeared to be many examples of misunderstanding, or even misappropriation, of the two terms.

But any attempt to provide a simple, clear-cut clarification of the difference between *affect* and *emotion* is somewhat challenging, not least of all because language and concepts become increasingly abstract the deeper one delves into specialist works; however, Massumi proposes that:

> Affect is “unformed and unstructured,” and it is always prior to and/or outside of conscious awareness (Shouse 2005).

Whilst in his essay ‘Why Emotions Are Never Unconscious’, Clore proposes that:

> […] emotions that are felt cannot be unconscious. (1994, p. 285)

Therefore it may be reasonable to suggest that considering affect as an unconscious process, whilst regarding emotion as a conscious one, could be a good place to start in differentiating the two terms, at least for the purpose of this thesis – so, for instance, the bodily response that arises due to the threat of an oncoming vehicle, or being caught in a tsunami, could be considered an example of *affect*; whereas crying in sympathy with an on-screen character’s situation would be seen as an example of *emotion*.

But Shouse, for one, is specific about the difference between emotion and affect:

> Although feeling and affect are routinely used interchangeably, it is important not to confuse affect with feelings and emotions. As Brian Massumi’s definition of affect - in his introduction to Deleuze and Guattari’s *A Thousand Plateaus* - makes clear, affect is not a personal feeling. Feelings are *personal* and *biographical*, emotions are *social*, and affects are *prepersonal*. (Shouse 2005).

And then by considering an aspect of the work presented by Deleuze and Guattari themselves, specifically their ‘autonomy of affect’ theory which proposes that affect is independent of the bodily mode through which an emotion is made visible (Schrimshaw 2013) it seemed to be incongruous, particularly as far as the topic of this study is concerned, to elevate the impersonal concept of *affect* over the personal and social factors that constitute a cinema-viewing experience and more readily align with the term *emotion*.

Another clarification of the two terms is provided by Lisa Feldman Barrett, writing an endnote to Chapter 4 of her book *How Emotions are Made: The Secret Life of the Brain*:

> Many scientists use the word 'affect' when really they mean emotion. They're trying to talk about emotion cautiously, in a non-partisan way, without taking sides in any debate. As a result, in the science of emotion, the word 'affect' can sometimes mean anything emotional. This is unfortunate, because affect is not specific to emotion; it is a feature of consciousness. (Feldman Barrett 2017).

Furthermore, Shaviro is emphatic about what is primarily engaging an audience:

> Reading a novel, hearing a piece of music, or watching a movie is an emotional experience first of all. Cognition and judgment only come about later, if at all. (Shaviro 2016)

And so throughout this study, it is proposed that the context for the work undertaken by a Sound Designer and Re-recording Mixer most appropriately lies within the boundaries of influencing audience *emotion*.

The challenge of defining what constitutes an emotion however remains. As Kathrin Knautz observes, whilst it may be straightforward to determine our own, because of the difficulty in actually defining emotions, some researchers resort to formulating a definition by instead looking at the features of emotions. (Knautz 2012)

Fehr and Russell comment on this conundrum:

> Everyone knows what an emotion is, until one is asked to give a definition. Then, it seems, no one knows. (1984, p.464).

In the introduction to his book *From Passions to Emotions*, Dixon (2003) suggests that the rise in academic work in a range of fields concerned with the emotions is a modern trend, one that is in direct contrast to the preoccupation

with intellect and reason of earlier studies. Furthermore, he feels that this is no bad thing:

> Being in touch with one's emotions is an unquestioned good. (Dixon 2003, p.1)

Through his research on *Pan-cultural recognition of emotional expressions* (Ekman et al., 1969) and his subsequent work *Basic Emotions* (Ekman, 1999) Ekman suggests that six fundamental emotions exist in all human beings: happiness, sadness, fear, anger, surprise and disgust.

Plutchik (2001) broadly agrees with Ekman, but further develops the categories by creating a wheel of eight opposing emotions, where positive emotions are counterpointed by equal and opposite negative states: joy versus sadness; anger versus fear; trust versus disgust; and surprise versus anticipation.

From Ekman and Plutchik's definitions, Antonio Damasio (2000) further suggests that more complex emotional states stem: such as embarrassment, jealousy, guilt or pride (sometimes referred to as *social* emotions), or well-being, malaise, calm, tension (*background* emotions). As one of the world's leading experts on the neurophysiology of emotions, Damasio summarises the fact that without exception men and women of all ages, social and educational backgrounds are subject to emotions; he also makes reference to the way different sounds evoke emotion:

> Human emotion is not just about sexual pleasures or fear of snakes. It is also about the horror of witnessing suffering and about the satisfaction of seeing justice served; about our delight at the sensual smile of Jeanne Moreau or the thick beauty of words and ideas in Shakespeare's verse; about the world-weary voice of Dietrich Fischer-Dieskau singing Bach's *Ich habe genung* and the simultaneously earthly and otherworldly phrasings of Maria João Pires playing any Mozart, any Schubert; and about the harmony that Einstein sought in the structure of an equation.

> In fact, fine human emotion is even triggered by cheap music and cheap movies, the power of which should never be underestimated. (Damasio 2000, pp.35-36).

The first studies of emotion with regard to sound were related to music and came in the late nineteenth century, coinciding with psychology becoming an independent discipline around 1897; although the early peak in studies was seen sometime later, in the 1930's and 1940's (Juslin and Sloboda 2010).

Today, a multi-disciplinary approach pervades the field of emotion in music, and although there is not yet unanimous agreement on whether there are uniquely musical emotions, or whether the nature of these emotions are basic or complex, the field of emotion in music is steadily advancing. (Ibid.)

Jenefer Robinson articulates the complexity that the analysis of music and emotions can produce:

> […] the sighing figure is heard as a sigh of misery (a vocal expression), a syncopated rhythm is heard as an agitated heart (autonomic activity), a change from tonic minor to parallel major is heard as a change of viewpoint (a cognitive evaluation) on the situation from unhappiness to happiness, or unease to serenity, and given the close connection between the two keys and the fact that the melody remains largely the same, we readily hear the evaluation as ambiguous or as shifting: the situation can be seen as both positive and negative. […] Overall we may hear the piece as moving from grief and anguish to serene resignation, all of which are cognitively complex emotions. (Robinson 2005, p.320).

However, Juslin and Sloboda broaden the perspective of the way sound can evoke emotion from that of a purely music-based discussion, by suggesting that it is now recognised that a significant proportion of our day-to-day emotions are evoked by cultural products other than music; and therefore designers should be mindful of emotion in the products and interfaces that they design, in order to make them richer and challenging to the user. (Juslin and Sloboda, 2010).

From the advent of the medium, moving-picture producers have described and promoted their films by describing the emotions that the audience is intended to feel when they watch them (e.g. horror, romantic-comedy or mystery-thriller). So it's reasonable to suggest that audiences have proven themselves to not only being susceptible, but even desirous, of having their emotions evoked in a movie theatre.

Holland, in *Literature and the Brain* (2009), writes on our emotional response to literary work, of which cinema is an important part: 'The brain's tricks become clearer at the movies.' (Holland, 2009, p.2).

Clearly then, it is important to consider what might be happening to an audience as they watch a movie.

Holland proposes that a well-designed soundtrack is instrumental in engaging and enveloping a viewing audience, and a listening-viewer absorbed by on-screen activities forgets their own body and its immediate surroundings, enabling them to be transported to all kinds of otherwise improbable locations and situations. Central to Holland's line of reasoning is that an emotion is a call to action, or a disposition to act; yet when we sit in the cinema and have our emotions evoked through the sound and pictures we are viewing, we remain seated. This, he suggests, is due to a unique contract with the work. Even though we are figuratively transported by our emotions towards a certain state of mind, we identify that it is the circumstances of the on-screen activity or character that has aroused these feelings within us, and it is not a direct consequence of us being in the represented situation. (Holland, 2009).

Because most bodily responses brought about by emotions are visible to others, they in turn bring about 'mirroring' in the viewer. Humans have a tendency to respond to emotional expressions they see with similar emotions themselves; and as early as 1890, Darwin noted that emotions communicate in this fashion. (Darwin, 1890).

But Holland suggests that since it is a mirroring process at work, the impulse to act on the emotion is actually inhibited: i.e. whilst watching certain

actions, motor regions of the brain experience an *impulse* to act (the mirroring). However, the brain *inhibits* this musculoskeletal expression through a process called the 'inverted mirror response'; more fully described by Marco Iacoboni (2008) in his work on 'super mirror neurons'. (Holland, 2009)

For Holland though, mirroring is not the complete picture of a fuller, immersive and emotional involvement with an on-screen subject. Our own past experiences of circumstances similar to the viewed events are also powerfully evoked; and he states:

> We bring to bear on what we now see, some feeling or experience from our own past. And my bringing my own past to bear on the here and now of tragedy makes me feel it all the more strongly. (Holland 2009, p.72).

Richard Gerrig includes this in what he calls a 'participatory response', and he notes how it can enrich and intensify one's 'emotional experience'. (Holland (2009) quoting Gerrig (1996)).

It is evident then that sound triggering or affecting human emotions is not just limited to music; other sounds too can contribute to this process. Certainly some of the wider range of emotional stimulation that Damasio describes sits comfortably within the remit of the audio post-production stages of filmed stories, or televised drama. Juslin and Sloboda's comments also suggest that there is both a basis and likely scope for the thoughtful use of soundtrack elements to evoke emotional responses within a listening-viewer; and Holland's description of how audiences engage with what they see on-screen further supports this proposition.

3.2 The relevance of speech and emotions research, and music and emotions research, to this study

Whilst there is little research dealing specifically with moving picture sound design and emotions, there is a substantial body of research concerning both speech and emotions (e.g. Banse & Scherer, 1996; Cowie, 2000; Pereira,

2000); and music and emotions (e.g. Hunter & Schellenberg 2010; Juslin & Sloboda, 2010; Swaminathan & Schellenberg, 2015).

Speech and music are two key elements of the compound that constitutes a moving picture soundtrack; and both contribute greatly to the viewing experience of movie audiences, not only by virtue of their *expressing* of emotion, but also by their being capable of *inducing* emotion in listening-viewers.

Three aspects of *speech and emotions* research are particularly relevant in this study.

First and foremost, both speech and a film's soundtrack are designed to communicate with an audience. A film soundtrack, intended as a compound of speech, sound effects and music, not only has the ability to be as literal as speech in portraying emotions (indeed it contains speech and therefore a character can utter words such as "I feel sad", telling the audience explicitly what emotion is at play), it can also be more so than a musical score alone might. However, it is important to make clear that this statement is not intended to diminish the importance of music in movies. Far from it; music is a powerful emotional tool, particularly when skilfully deployed within a film soundtrack (e.g. Damasio, 2000).

Very many movies are most memorable precisely for their featured musical interludes[2], which can create iconic snapshots that go on to define a production, long after the film's fuller storyline has left the consciousness of audiences; e.g. *Tiny Dancer* (Comp. Elton John / Bernie Taupin) in *Almost Famous* (2000) (Dir. Cameron Crowe / Sound Designer Mike Wilhoit), *Bohemian Rhapsody* (Comp. Freddie Mercury) in *Wayne's World* (1992) (Dir. Penelope Spheeris / Sound Designer John Benson) or *Always Look On The Bright Side of Life* (Comp. Eric Idle) in *Life of Brian* (1979) (Dir. Terry Jones / Re-recording Mixer Hugh Strain) to name but three of a long, 90-years-plus list,

[2] A traditional and frequently heard idiom amongst film industry technicians wanting to highlight the importance of the soundtrack is 'No one ever came out of a cinema whistling a two-shot'.

that began with *The Jazz Singer* (1927) (Dir. Alan Crosland / Sound Engineer Nathan Levinson), the film widely considered to be the first commercial 'talkie'.[3]

But if songs or arias with a text are discounted, it is reasonable to argue that a music score is less directly meaningful, and overall, it is more abstract than literal in its nature.

As an aside to this immediate point, but nonetheless still highly relevant to the way music is used in movies, there is also the constant consideration by the Re-recording Mixer that music has the ability to emotionally overwhelm a soundtrack, if its application is not judiciously metered and carefully balanced with the other mix elements. As Sider suggests:

> Rather than allow the audience to come to their own conclusions the music presses an emotional button that tells the audience what to feel, overriding the words and thoughts of the film's characters. (Sider 2003, p.9)

Tarkovsky would seem to go further:

> Above all, I feel that the sounds of this world are so beautiful in themselves that if only we could learn to listen to them properly, cinema would have no need of music at all. (Tarkovsky 1987, p.162

So whilst this thesis looks carefully at the interplay between dialogue and sound effects, a relationship to which music also makes a conspicuous contribution, music in this study is treated respectfully for its emotional power in its own right; but from a Re-recording Mixer's perspective, music is only one of the sounds that require balancing. Because all sounds – not just music – can be emotionally important in a movie (e.g. a single gunshot suddenly featured in a scene that had only music playing will immediately draw the listener's attention away from the music) and whilst a sound may be interpreted in

[3] Director Alan Crosland and Sound Engineer Nathan Levinson had completed a movie for Warner Brothers a year earlier - *Don Juan* (1926) - that used the same Vitaphone sound playback system as *The Jazz Singer* (1927). However, although the soundtrack of *Don Juan* was synchronized to picture, it consisted solely of music with no speech from the actors.

several ways, often depending on the context it is heard in, all sounds in this study are referred to, considered as, or classified by, their *primary emotional function* or purpose in the soundtrack.

And so it is that through the combination of all of these sounds, the relative proportions of which are solely determined by the Re-recording Mixer during the act of pre-mixing and final mixing, the underlying meaning of the soundtrack is revealed.

Secondly, when considering the soundtrack and the way it forms part of an audio-visual work, there are comparisons that may be drawn between the Re-recording Mixer's mix-balancing with an emotional intent in mind and the way that everyday speech is used to convey emotion. In speech, the *meanings* of words are quite fixed within a language, yet the actual *emphasis* of the words being spoken can be quite fluid due to inflection, tonality or accent.

The emphasis of the words plays an important role in inducing different emotions in the listener. For example, someone can say the words "I'm really sad" in a helpless sounding way, or in a sarcastic sounding way. The words are the same, and indicate an emotion, but the sound of the words determines the emotion we, as listeners, perceive.

So too in a movie, where the words of dialogue the characters use may intentionally have clear meaning for the plot and storyline; yet when balanced amongst the other mix elements present in the soundtrack, what results is a listening experience that is emotionally richer due to the balancing of all the sound elements sitting alongside the literal speech.

Additionally the visual elements of a film (acting, editing, lighting, grading, composition, etc.) can powerfully portray a particular emotional direction (similarly to how the meaning of words do in speech); but the soundtrack, and the balancing of its elements by the Re-recording Mixer, can also in this case shift the emotional direction of the overall audiovisual experience.

This is similar to how the changes in prosodic patterns that naturally exist in speech produce emotional shifts; e.g. the tendency to speak unwittingly loud when gleeful, or in a higher than usual pitch when greeting a sexually attractive person (Bachorowski, 1999), and is described in other research studies of listeners inferring emotion from vocal cues (see van Bezooijen, 1984; Frick, 1985; Graham, San Juan & Khu, 2016 to name but a few).

In an audiovisual piece of work with emotional meanings already suggested through visuals, words and other selected sounds, variations in emotional meaning can also be produced by manipulating the mix balance of the sound track; similarly to how natural variations in pitch, loudness, tempo and rhythm do in speech.

3.3 Hearing the soundtrack

In *Listening*, the opening chapter of social theorist and writer Jacques Attali's work *Noise: The Political Economy of Music (1985),* the author attaches a much greater importance to the act of listening than that often attributed to the purely cinematic act of audition, or the emotional effect a soundtrack may evoke:

> For twenty-five centuries, Western knowledge has tried to look upon the world. It has failed to understand that the world is not for the beholding. It is for hearing. It is not legible, but audible. (Attali 1985, p.3).

Which implies, in Attali's opinion, that sound itself carries a quality, or set of qualities, that can not only inform a cinema audience, but also impart meaning on what they are seeing; which in turn relates to the assertions of Holland (2009) and accords with this research's notion that (especially) within narrative filmmaking, a significant responsibility may be borne by the soundtrack to fully engage, communicate and emote an audience.

In his essay *Art in Noise*, Mark Ward suggests that:

> […] it is unlikely one may have a meaningful narrative experience without it also being an emotional one. (Ward, 2015, p.158).

Ward also argues against the primacy of speech and music in the traditional process of soundtrack dissection, instead elevating what might be termed as environmental sound, or sound effects, to a status of at least equal to dialogue and score (Ward 2015). This also implies that these fuller soundtracks require careful balancing by the Re-recording Mixer:

> Sound design […] is considered to be a process by which many sound fragments are created, selected, organised and blended into a unified, coherent and immersive auditory image. (Ward, 2015, p.161)

Ward then goes on to make three key assumptions:

i) Cinema is not a visual medium, but multimodal: what is cinematic about cinema is moving imagery, not moving pictures. (Ward, 2015, p.158)

ii) Sound can modify visual perception: sound design through careful crafting, may steer and deflect the eye's passage across a screen, or draw the eye to some objects but disregard others. (Ward, 2015, p.159)

iii) […] contemporary sound design [is] a playful recombination of auditory and visual fragments, and a heightened manipulation of auditory spatialisation, temporal resolution, and timbre. (Ward, 2015, p.161)

In arguing that the cinema experience is an emotional one, Ward sub-categorises the construction of a soundtrack into three distinct areas; and his citing of auditory spacialisation and temporal resolution directly accord with two of this research's sound areas, e.g. Spatial and Temporal (which will be more thoroughly described in Chapter 5).

Michel Chion also utilises a tripartite classification when he describes the way in which soundtrack elements are heard by an audience; and he refers to these three states as *causal, semantic* and *reduced listening.*

Causal listening, the most common form of listening mode, 'consists of listening to a sound in order to gather information about its cause (or source)' (Chion, 1994, p.25). Causal listening can condition, or even prepare, the listener by the very nature of the sounds heard - for instance, the sound effect of a dog barking readily brings to mind the image of a dog.

Chion goes on to describe how a film soundtrack might manipulate causal listening through its relationship to the pictures, a term he calls *Synchresis*; whereby we are not necessarily listening to the initial causes of the sounds in question, but rather causes that the film has lead us to believe in:

> [In] causal listening we do not recognize an individual, or a unique and particular item, but rather a category of human, mechanical, or animal cause: an adult man's voice, a motorbike engine, the song of a meadowlark. Moreover, in still more ambiguous cases far more numerous than one might think, what we recognize is only the general nature of the sound's cause. (Chion, 1994, p.27)

Chion describes semantic listening as 'that which refers to a code or a language to interpret a message'. (Chion, 1994, p.28). For Chion, causal and semantic listening can occur simultaneously within a sound sequence:

> We hear at once what someone says and how they say it. In a sense, causal listening to a voice is to listening to it semantically as perception of the handwriting of a written text is to reading it. (Chion, 1994, p.28)

Chion thirdly suggests that reduced listening refers to the listening mode that focuses on the traits of the very sound itself, independent of its cause and of its meaning:

> Reduced listening has the enormous advantage of opening up our

> ears and sharpening our power of listening [...] The emotional, physical and aesthetic value of a sound is linked not only to the causal explanation we attribute to it but also to its own qualities of timbre and texture, to its own personal vibration. (Chion, 1994, p.31).

Finally, Chion asserts that natural sounds or noises have become the forgotten or repressed elements within the soundtrack - in practice and in analysis. Whilst music has historically been well studied and the spoken voice more recently has found favour for research:

> […] noises, those humble footsoldiers, have remained the outcasts of theory, having been assigned a purely utilitarian and figurative value and consequently neglected.
> (Chion, 1994, pp.144-145)

Another view of separating an audience's listening processes is proposed by Sound Designer and Re-recording Mixer Walter Murch (*American Graffiti* (1973), *The Conversation* (1974), *Apocalypse Now* (1979))[4]. He describes a way in which he views the elements of a soundtrack 'positioned' in a virtual spectrum for auditioning; and he suggests that this positioning is instrumental in how the soundtrack is processed in the brain of the listening-viewer.

In his essay *'Dense Clarity, Clear Density'* Murch describes the available sound design palette as consisting of a spectrum of audible frequencies between 20Hz and 20kHz – the nominal range of human hearing – and likens this to the spectrum of visible colours: from the colour red at one end of the scale, to the colour violet at the other.

Conceptually superimposing sound on to this visual image, he places what he describes as 'Embodied sound' (the clearest example of which is music) at the Red extreme and what he describes as 'Encoded sound' (the clearest example of which is speech) at the Violet extreme. With these two

[4] As well as being the Sound Designer and Re-recording Mixer, Murch also picture edited *The Conversation* (1974) and *Apocalypse Now* (1979). He won an Academy Award for Best Sound Mixing on *Apocalypse Now*.

extremities of speech and music bracketing the available range, all usable sound must therefore fall between them; with almost all sound effects somewhere in the middle – half-way between language and music. Murch considers these sound effects, whilst usually referring to something specific within a soundtrack, not to be as abstract as music, but nonetheless, not to be as universally and immediately understood as spoken language.

Murch goes on to suggest that separate areas of the brain process the different types of audio information, with encoded sound (language) dealt with by the left half of the brain, and embodied sound (music) dealt with by the right hemisphere. He then proposes that by evenly spreading the elements of his mix between the two pillars of the audio-scale, a clearer (even though busier) soundtrack, with a higher mix-element count, can be achieved than a soundtrack in which multiple mix-elements are concentrated in one particular area of the audio sound spectrum.

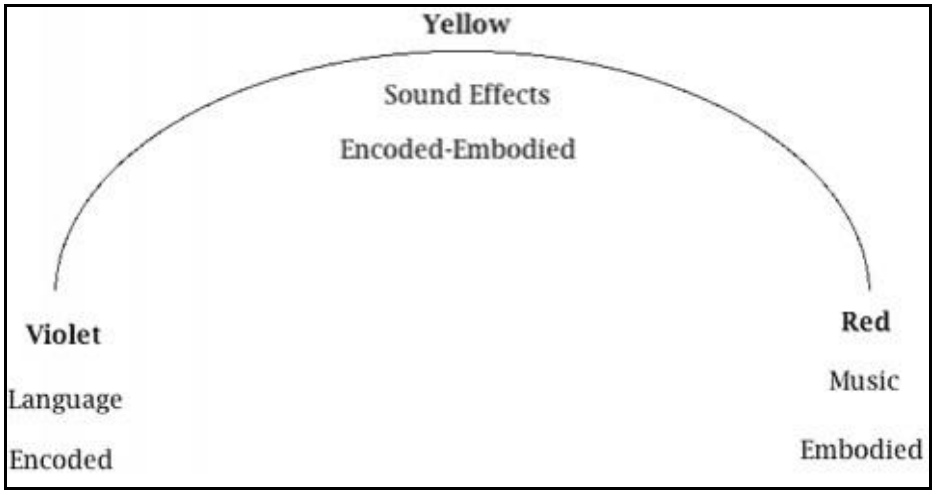

Figure 1 – Walter Murch's 'Encoded – Embodied' sound spectrum.

This left-right duality of the brain, in Murch's opinion, therefore enables twice as many 'layers' - five - to be achieved in a soundtrack when the type of sound used is spread; for example:

Layer 1: dialogue;
Layer 2: music;

Layer 3: footsteps (Murch's ‘linguistic effects’);
Layer 4: musical effects (Murch's ‘atmospheric tonalities’) and
Layer 5: sound effects.

If however you desire two-and-a-half layers of dialogue to be heard simultaneously, elements elsewhere must be sacrificed to retain clarity in this density of dialogue. Murch refers to this phenomenon as his 'Law of two-and-a-half' and this ‘rule-of-thumb’ is defined by Murch on the basis of his long experience as a Sound Designer, a Re-recording mixer and sound editor, as well as a picture editor. (Murch, 2005).

Ward, Chion and Murch’s theories are particularly significant for this study as they address issues directly related to soundtrack production and listening-viewers.

3.4 The emotional impact of linking what we hear, to what we see

In her paper ‘Making Gamers Cry’, Karen Collins suggests that:

> Our emotional and neurophysiological state can be directly affected by what we see: for instance, if we see pain or fear in someone else, we understand this in terms of our own psychophysiological experience of similar pain or fear. For example, neurons that normally fire when a patient is pricked with a needle will also fire when the patient watches another patient being pricked. (Collins, 2011, p.2)

This highlights the fact that seeing something on-screen can evoke an emotional reaction in the observer’s brain through the activity of so-called ‘mirror neurons’, which are thought to be the main route to human empathy. Neuroscientist Vilayanur Ramachandran believes that these mirror neurons actually dissolve the barrier between self and others, light-heartedly referring to them as ‘Gandhi Neurons’. (Ramachandran, 2009).

But what would seem to be highly significant to this investigation into emotions evoked by sound, is what Keysers et al. (2003) described from the research they conducted into monkey mirror neurons, in which they found that the same neurons fired whether an action is performed, seen or simply *heard:*

> By definition, 'mirror neurons' discharge both when a monkey makes a specific action and when it observes another individual making a similar action (Gallese et al. 1996; Rizzolatti et al. 1996.) Effective actions for mirror neurons are those in which a [monkey's] hand or mouth interacts with an object. (Keysers et al., 2003, p.628)

In plain terms:

> These audiovisual mirror neurons respond as if we are experiencing the cause behind the event, when only the sound of the action is presented. In other words, when the monkey hears the sound, the brain responds as if it is also seeing and experiencing the action creating the sound. (Collins, 2011, p.2)

These results would seem to add credence to the notion that sound alone is a powerful emotional tool that could be put to good use in moving picture production. This clinically observed reaction to the effect of 'hearing-without-seeing', (which in cinematic rather than laboratory terms could include the practice of 'sound-leading-picture'), is an established sound design technique frequently used to purposely develop the tension of an unsettling event or situation, through the presence of (often) abstract sound effects, whose origination remain for the most part unseen. However, as the story develops, the sound editor in the tracklay, and then the Re-recording in the mix itself, may consider that what were originally Abstract sound area sounds, later contribute to the Narrative sound area (for a more thorough definition of the sound areas see Chapter 5).

Dykhoff notes:

> The spectators' imagination is by far the best filmmaker if it's given a fair chance to work. The more precise a scene is, the

> more unlikely it is to affect the audience emotionally. By being explicit the filmmaker reduces the possibilities for interpretation. […] With a minimal amount of visual information and sounds suggesting something, you can get the audiences imaginations running. (Dykhoff, 2003)

There are many examples of this style of feature film sound design, but a notable example is the sounds associated with the dinosaurs featured in *Jurassic Park* (1993) (Sound Designer and Re-recording Mixer - Gary Rydstrom), which are seen on-screen for only 15 of the movie's total 127 minutes - a little over 10% of the film's total running time; whilst their mysterious 'off-screen' sound is heard by the audience long before they eventually make an appearance. (Van Luling, 2014)

With regard to audience emotions being evoked by the soundtrack, Dykhoff goes on to make a point that is highly relevant to this study:

> It's interesting to speculate about how much information the trigger must contain and how much it actually triggers. (Dykhoff, 2003)

The research of existing literature on emotions and film has indicated that the understanding of the relationship between the overall organisation, the emphasis within the mix of a soundtrack, and the emotions evoked in an audience, is still very much in its infancy; even if work on the correlation between emotion categories and types of sounds, or emotions and the acoustic parameters of sounds in music and speech, has begun to be examined more closely:

> Without doubt, there is emotional information in almost any kind of sound received by humans every day: be it the affective state of a person transmitted by means of speech; the emotion intended by a composer while writing a musical piece, or conveyed by a musician while performing it; or the affective state connected to an acoustic event occurring in the environment, in the soundtrack

> of a movie, or in a radio play. […] emotional expressivity in sound is one of the most important methods of human communication. Not only human speech, but also music and ambient sound events carry emotional information.
> (Weninger et al. 2013)

Whilst sounds such as speech, music, effects and atmospheres constitute the traditional groupings of sounds within a moving-picture soundtrack - especially during its editing and mixing stages - the Four Sound Areas of this research are not intended to be considered as alternative labels for the long-established audio post-production working categories of ‘dialogue’, ‘music’ and ‘effects’ stems. Rather they sit alongside, instead of replacing, those headings; and in any case they do not directly correspond to those categories, by virtue of their being used in a different context: the traditional labels are used primarily in the sub-master stems delivery process before (and after) the final mixing of the soundtrack has been undertaken by the Re-recording Mixer.

Instead, the Four Sound Areas framework of this study is an attempt to provide a completely different kind of structure: one that can guide Sound Designers on how best to group emotionally-complimentary sounds together at the track-laying stage of a moving-picture project (i.e. a ‘bottom-up’ approach); and then help Re-recording Mixers to understand which elements of a mix require emphasis to increase their ability to enhance, steer or evoke an audience towards a particular area of emotion (i.e. a ‘top-down’ approach),.

A definition of the Four Sound Areas is detailed in Chapter 5 of this thesis, which also includes practical examples and critical reflection on the practice.

3.5 Conclusions

This chapter reviewed the main professional and academic literature relevant for this PhD study. In the next chapter the methodology used in this research project is outlined.

4 Methodology

4.0 Introduction

This chapter outlines the methodology used in the practice-based study. It describes the need for an interdisciplinary approach, it summarises the challenges existing in practice-based research, and it lists the main limitations of this research.

4.1 The methodology used for this practise-based study

As outlined in Chapter 1, this PhD is a practice-based research study into emotive sound design within contemporary moving-picture audio production and post-production; one that investigates a new approach to sound design whereby a Sound Designer can consider structuring, and a Re-recording Mixer emphasising, specific elements of a moving-picture soundtrack to steer and intensify the intended emotional experience for listening-viewers. At its core, this study looks into the relationship between the creative process of mixing moving-picture soundtracks and the intensity of the emotions elicited by that final film.

The Four Sound Areas framework of this thesis (detailed in Chapter 5) is borne from the individual way that the author has come to construct soundtracks and approach their mixing through experience; and a natural development of this is to carry out a more formal investigation to see whether the framework that worked well for the author and his clients, could also be of benefit to other Sound Designers and Mixers, as well as contribute to the academic understanding and analysis of moving-picture soundtracks and their associated properties.

The methodology used by this thesis involves initially exploring existing texts by sound theorists and academics, finding references and information to other practitioners' methods for creating moving-picture soundtracks, identifying similarities and differences with the author's approach and then offer a critical reflection on the author's own work on the basis of this background; all of which aims to determine both a theoretical and practical context for the research questions explored in this thesis. The investigation analyses in detail three examples of soundtrack design and mixing drawn from a forty year period of

cinema sound development: ranging from the monophonic presentation of *Winter Light* (1963), the ground-breaking surround-sound movie *Apocalypse Now* (1979) and a more contemporary, multi-channel presentation, *Dogville* (2003).

Furthermore, the thesis details how the proposed Four Sound Areas framework was used by the author to create three original soundtracks for different types of programming; and it is these that form the main output of this PhD by Creative Practice: a short film *The Craftsman* (2012) a full length, theatrical release feature film *Here and Now* (2014) and a sport Outside Broadcast, *Commonwealth Games Boxing* (2014).

Furthermore, a reflective and critical analysis of the author's practical use of the framework in creating the portfolio pieces' soundtracks is provided. This includes reflections on the ease of integration of this new sound design and mixing process into the workflow of existing television production and feature film post-production procedures, i.e. those used by the location sound recording, picture editing and live broadcast transmission stages.

Additionally, external feedback for the creative and operational usefulness of the Four Sound Areas framework used in the production of these three titles comes from the acceptance and satisfaction of the commercial clients who commissioned and paid the author to sound design and mix these released and broadcast works.

This methodology has a two-fold objective: firstly, to show that the Four Sound Areas framework is fit for operational purpose on different styles of commercial programming, both from the point of view of the practitioner and that of the client; and secondly, by providing scope for a detailed examination of a paradigm designed to demonstrate both practical and theoretical usefulness.

4.2 The current challenges and debates around practice-based research

It is now well over thirty years since the first PhD by Creative Practice was introduced, initially delivered in Australia in the mid-1980s[5] and followed

[5] Practice-based PhDs began in Australia in 1984, when the University of Wollongong and the

shortly afterwards by universities in the United Kingdom; but it could be said that during its lifetime, this type of degree has not had an easy passage – with difficulties being felt by candidate and academy alike. Jonathan Carr writes from his own experience as a PhD by Practice candidate, noting in his thesis concerned with filmmaking, that he is conscious of:

> […] persistent questions over the quality of practice-based work. (Carr 2015, p.26)

He also notes:

> While this scepticism certainly shows a lack of insight into the sometimes gruelling, time-consuming and stressful practice of filmmaking, it also hints at the deeper truth: that there is a still a widely held suspicion that practice-based study does not measure up to its more traditional equivalent in terms of academic legitimacy. (Ibid, p.25)

Even wondering if:

> […] there is also a degree of 'knowledge snobbery'. (Ibid. p.27, quoting Willems, 2010, p.9)

There are several notable works that specifically examine the concept of *Practice as Research* (PaR) and the challenge such work has had in gaining academic acceptance in some quarters, particularly in the field of Humanities and the Arts (e.g. Nelson 2013, Brown and Sorenson 2009, Candy 2006) the kernel of which would seem to be the need to overcome a lingering institutional distrust of the results such Practice-based research actually presents.

Yet Smith and Dean strike a more optimistic note:

> The turn to creative practice is one of the most exciting and revolutionary developments to occur in the university within the

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University of Technology, Sydney (UTS) introduced Doctorates in Creative Writing (Candy 2006) It is understood that this PhD by Practice is the first in the world to address moving-picture Sound Design.

> last two decades and is currently accelerating in influence. It is bringing with it dynamic new ways of thinking about research and new methodologies for conducting it, a raised awareness of the different kinds of knowledge that creative practice can convey and an illuminating body of information about the creative process. (Smith and Dean 2009, p.1)

The concept of Practice as Research also raises the question of whether the research itself is practice-based or practice-led; and Candy provides definitions for both:

> Practice-based Research is an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice. Claims of originality and contribution to knowledge may be demonstrated through creative outcomes which may include artefacts such as images, music, designs, models, digital media or other outcomes such as performances and exhibitions. Whilst the significance and context of the claims are described in words, a full understanding can only be obtained with direct reference to those outcomes. (Candy 2006, p.3)

She adds:

> Practice-led Research is concerned with the nature of practice and leads to new knowledge that has operational significance for that practice. The main focus of the research is to advance knowledge about practice, or to advance knowledge within practice. In a doctoral thesis, the results of practice-led research may be fully described in text form without the inclusion of a creative outcome. (Ibid.)

But Smith and Dean find Candy's binary-state rather too prescriptive, instead stating:

> We do not see practice-led research and research-led practice as separate processes, but as interwoven in an iterative cyclic web. (Smith and Dean, 2009, p.2)

And then there is a further sub-division to consider, which is that of Conceptual research. Smith and Dean continue:

> Conceptual research is more to do with argument, analysis and the application of theoretical ideas, and is central to humanities research. […] Practice-led research practitioners who are particularly concerned with the relationship between theory and practice will see this kind of research as being most relevant to them. (Ibid.)

The current state of affairs regarding Practice as Research would seem to suggest then that practitioner and academy are likely to remain uncomfortable bedfellows for some time to come; superficially sitting alongside each other, but with a constant, below-the-surface unease of subducting tectonic plates, as it were.

But like any argument, there are two sides to consider; and in this instance, both have merit. Nelson comments:

> Given the historical divide between theory and practice in the Western intellectual tradition, moreover, it is not surprising that misunderstandings within and without the academy arose when it appeared that arts practices were suddenly becoming acceptable in the research domain. It did not help that, misunderstanding PaR in believing their professional practice self-evidently constituted research, some would-be practitioner-researchers were reluctant to do anything other than they did as established professionals. (Nelson 2013, p.25)

It is undeniable that the author arrived at this PhD by Practice from an experienced Practitioner-based point of view, with a considerable number of notable credits and a sizeable back-catalogue of creative work to his name.

However, to the best of the author's ability, this thesis has been approached with exactly the same honesty, rigour and principles in mind as if this were a more orthodox research doctorate.

Carr succinctly encapsulates a balance that needs – and should be possible – to strike:

> […] Willems considers that 'if the purpose of research is indeed to create 'new knowledge', then that new knowledge has to be 'authentic' new knowledge, which is, in my experience, created through the reconciliation of the 'academic theory' and the 'professional reality'.
> (Carr 2015, p.30; quoting Willems 2010, p.20).

At its core, this thesis is very much concerned with the relationship between theory and practice, it is aimed at academics and practitioners, and desires an outcome that is of benefit to both; and in aligning with Smith and Dean's sentiments, this study is at times practice-based, but then at others practice-led; and yet would also seem to be underpinned by the conceptual nature of this thesis' proposition.

4.3 An interdisciplinary methodology

Not only does practice-based research need to satisfy and talk to academy and practitioners; often there are additional stakeholders - such as commercial clients, audiences and other professionals - that can reasonably judge the successfulness of the practice presented.

4.4 Limitations

This research, as with any work restricted in time and resources, has a number of limitations, which were at least in part dictated by the type of PhD (focused on creative practice rather than, for example, theory), the need to maintain a clear focus, and the expertise of the researcher.

The literature review touches upon a number of large research areas (emotions, voice and emotions, music and emotions) only to the extent in which these are relevant for the focus of this research. The author is aware that many other sources could be referenced and cited, but the limited word count imposed a strict selection of what could be mentioned.

Additionally the number of film examples analysed and presented had to be restricted. Cinema – and television – are global media; available, consumed and enjoyed by almost every race and culture on earth. However, the three feature films from other practitioners chosen for analysis in this thesis at first glance might seem somewhat mainstream and rather obviously Western in origin: from Sweden *Winter Light* (1963), the United States of America *Apocalypse Now* (1979) and from Denmark, *Dogville* (2003).

It is impossible to be anything approaching definitive whilst limiting the choice of other practitioners work to just three examples; but the rationale of the selection was thus: *Winter Light* (1963) is a black and white art house film, and included because it is not presented in the author's native language, but in the original Swedish – the dialogue can therefore be considered as an integral function of the soundtrack as a whole, rather than the listener inferring emotion directly from the meaning of the words used by the actors (not withstanding any emotion suggested by tonality, tempo or emphasis; the emotional impact of dialogue and delivery being covered elsewhere in this thesis). Also, as a monophonic soundtrack, it offers the most basic form of presentation.

In comparison, *Apocalypse Now* (1979) is one of the first Hollywood examples of dense, multi-channel sound design and mixing and serves as a direct contrast to the intentionally stripped-back, and in comparison, bare *Winter Light* soundtrack.

The final choice of *Dogville* (2003) is principally down to the understated, clever complexity of its 5.1 soundtrack, and the fact that it is specifically designed to work without the aid of supporting visual cues throughout the movie; an unusual thing to aim for and successfully sustain. It is also included to represent the Independent film genre.

Whilst the three films are there to represent three distinct – and subtly different – areas of film production: art house, Hollywood and Independent, there is also a professional acknowledgement, admiration and respect for these specific pieces of work; and particularly for the protagonists behind them: Bergman (*Winter Light*) and von Trier (*Dogville*) being Directors who conspicuously have sound as an integral part of their creative filmmaking process; whilst Murch (*Apocalypse Now*) is a Sound Designer and Mixer whose work as a Practitioner has done so much to pave the way for sound practice to command attention from the academy.

Of course, there are other notable films that could have taken the place of these three examples, similarly included for their qualities of sound design and mixing, and ready analysis. The inclusion of world cinema examples would have given a greater sense of breadth, too; but close to home, without doubt considering the prominence of actuality sound used in French cinema, the routine and total replacement of off-screen actors voices in Italian productions, or the use of sound effects in dark, Spanish fantasy films would be interesting to explore.

Further afield, the use of non-diegetic sound in colourful Indian 'Bollywood' productions, the exaggerated sound effects in epic Chinese kung-fu movies or the religious and ethnic differences that need to be accommodated by the Nigerian 'Nollywood' cinema industry (a country of some 186 million people and 500 different languages[6]) would equally make for an interesting investigation into the relevance of the Four Sound Areas framework.

Instead, the examples that were chosen for analysis in this thesis are here because they offer a ready opportunity to observe instances of the Four Sound Areas framework in action, within three familiar styles of feature film production, with distinct contributions from exceptional practitioners.

[6] The three biggest sectors of the Nigerian cinema industry are those of the Yoruba, Hausa and Ghanaian-English languages (the portmanteau term 'Nollywood' being culturally and geographically more accurately applied to the Yoruba films of Western Nigeria; and the sobriquet 'Kannywood' applied to Hausa films emanating mainly from Kano, in the North of the country).

4.5 Conclusions

This chapter has described the methodological approach of this practice-based research. The next chapter describes in more detail the Four Sound Areas framework and with that in mind analyses three major pieces: *Winter Light*, *Apocalypse Now* and *Dogville*.

5 Defining the Four Sound Areas

5.0 Introduction

This chapter presents the Four Sound Areas in more detail and discusses it in relation to other existing categorizations. It then uses it as a tool for analysing the emotional design of three major works: *Winter Light*, *Apocalypse Now* and *Dogville*.

5.1 Concept

The concept of the Four Sound Areas is the culmination of around twenty years worth of thinking by the author about the perceived meaning of sounds when listening to the component parts of a full soundtrack, i.e. the individual mix stems; a thought process that originated from hearing the isolated parts of a full mix as they were being delivered for syndication purposes: a case of watching the same, familiar pictures of a particular project, accompanied only by the sub-mix stems required by that project's 'Deliverables' document. Typically this would include a 'sound effects and atmospheres' only mixed stem (referred to as 'clean effects'), then a 'music with sound effects and atmospheres' mixed stem (the 'music and effects' or 'M&E' mix), a 'music only' mixed stem (called 'clean music') and finally a 'dialogue only' mixed stem (known as 'clean dialogue').

Until relatively recently, due to a combination of hardware constraints and computer processing power, it was not possible to easily and simultaneously buss and record these mix-stems on a DAW. Instead, the whole film would need to be watched by the Re-recording Mixer, over and over again, until all the sub-mixes required for delivery were complete. However, the 'happy accident' of that elongated delivery process – and the consequence of the countless extra hours spent in the mixing theatre – provided the impetus for this investigation.

As a Re-recording Mixer regularly engaged in creating stems, the author started to notice how sounds less prominent in the full mix took on a greater significance when the dialogue, or the music, were not present. For the author at least, there were many instances of a very different 'feel' to the on-screen

pictures; and sometimes something that was thought to be more emotionally interesting or sonically significant, was actually lost when sat within the full mix.

It is quite usual, certainly when a sound editor is looking after all aspects of audio post-production including the final mix, that they will operate to a tried and tested formula: start with a dialogue edit, back-fill any gaps with room tone and atmospheres, look for examples of specific sound effects that need to be added and then – as it usually arrives as the last of the audio assets – fit the music around the dialogue, making sonic space as necessary by reducing the relative level of the sound effects and atmospheres to accommodate the music.

However, for the author, this rather prescriptive approach didn't take into account the new and exciting possibility of exploring how individual sounds could work to support a plot, if they were considered not just under a general heading of sound effects or atmospheres, but in their own right as emotional drivers or pointers, irrespective of their conventional classification within the mix stems.

5.2 Definition

This practice-based research proposes that the inter-relationship between all of a film's soundtrack elements is contained within four distinct sound areas, called the *Narrative*, *Abstract, Spatial and Temporal*; and this framework is significant on two counts: firstly, it enables a Sound Designer to create and prepare a soundtrack for mixing that will have been designed in such a way so as to achieve an enhanced emotional impact; (i.e. a 'bottom-up' approach to creating, selecting and assembling the soundtrack elements.) Secondly, it goes on to propose that the mix-balance between the sounds contained within these Four Sound Areas – which is under the total control of the Re-recording Mixer – is fundamental to the success of eliciting and emphasising a desired emotional response from a listening-viewer; (i.e. in this case, a 'top down' approach, emphasising specific sounds from those supplied.)

To use an architectural analogy: it is as if the Sound Designer is given permission to choose all the materials that a house will be built from (e.g. sandstone, cinder block or brick); whilst the Re-recording Mixer is given the creative freedom to choose the shape and style of the house, using the materials provided by the Sound Designer.

From analysing the creation of soundtracks using the Four Sound Areas framework – which specifically avoids categorizing sounds in a traditional 'dialogue / music / effects' manner – the chameleonic nature of sound becomes revealed: i.e. many sounds have the ability to evoke a different emotional effect, depending on their principle sound area characteristic.

For example, in a Bar or Restaurant scene, heard conversation could either be dialogue from the *Narrative* sound area (it is significant to the plot and storyline and strongly portrays the emotions of the principle characters); or act as murmured conversation from the *Abstract* sound area in the background (to illustrate the presence of other patrons and the general atmosphere of the place); be acoustically processed to form part of the *Spatial* sound area, (perhaps appearing to be spilling-in from the next room, or outside of the premises, inducing curiosity of what is to come); or utilised principally for its *Temporal* quality (depending on whether the foreground or background speech in question is fast or slow-paced, it can inform the listening-viewer of the energy level of the scene, indicating whether the situation is one of calm or one of agitation).

However, as already suggested, the *types* of sound utilised in a soundtrack, and the soundtrack's overall *balance*, cannot exist independently of each other. Put more simply, intrinsically, a sound (*its type*) is either loud or soft (*its balance*) in the mix; it is conspicuous or it is submerged.

Specifically, this research proposes that the successful evoking of emotions through the Four Sound Areas framework is not only due to the choice of sound by the Sound Designer. Evocation is most reliably achieved when the Re-recording Mixer emphasises the specific sound area (i.e. its relative level in the mix) at key moments in the soundtrack's time-line - the

extent of which is controlled solely by the Re-recording Mixer. The Sound Designer's choice of evocative sounds alone cannot complete their emotional task, without them also being brought to prominence in the mix by the Re-recording Mixer.

The Four Sound Areas are described in this way:

The Narrative Sound area is concerned with sounds that are used to communicate meaning or insight. Dialogue and commentary are important examples of this area in the sound mix, but it may also include certain diegetic music, as well as symbolic and signalling sounds such as the ringtone of a telephone, ambulance sirens *and so on* as their meaning is clearly defined, almost like a language.

A sound may be considered to be within the Narrative sound area if it is used by the sound designer to:

1) confer significance to a particular narrative point or event

2) conspicuously draw attention to a plot point

3) describe an action or an event

4) be meaningful to plot progression, with its significance readily understood by the listening-viewer.

The Abstract sound area is concerned with sounds that are less codified in their meaning, such as atmospheres, backgrounds, room tones and synchronous and non-synchronous sound effects, as well as abstract diegetic music, where the music is being used as an emotive, atmospheric device rather than for signalling something specific. In the case of speech or vocal sounds, these are sounds that are chosen for the emotional effect of their tonality or inflection, rather than being recognisable in a literal or language-related way.

A sound may be considered to be within the Abstract sound area if it is used by the sound designer to set a mood, a characteristic or a theme for a

scene without intending the listener-viewer's attention to be consciously drawn towards its presence in the mix.

The Temporal Sound area is concerned with the temporal evolution of the soundtrack, through rhythm, pace and punctuation; such as the non-diegetic music score or a specific sound design element with a strong rhythm, and is characterised and contrasted by the difference between high rhythm, fast pace, high structure and, conversely, slow pace, loose structure and low rhythm. Although this can mean that the Temporal sound area can envelop many types of sound effects, music and dialogue; a sound should only be considered as being categorised as part of the Temporal sound area when its temporal evolution e.g. its intended rhythm or pace, *is its most important contribution to the sound design*.

Dialogue for instance may be fast or slow-paced, for intentional emotional effect. At one end of the temporal axis, high conversational energy can require that the audience remain highly attentive; screenwriter Aaron Sorkin (*A Few Good Men* (1992), *Charlie Wilson's War* (2007), *The Social Network* (2010)) is well-known for his fast-talking characters. Describing the speed of speech in *The Social Network* (Sound Designer and Re-recording Mixer - Ren Klyce), Sorkin comments:

> We started at 100 miles an hour in the middle of a conversation and that makes the audience have to run to catch up […] We were always running ahead. I'm not writing something that's meant to be read; I'm writing something that's meant to be performed. (Grosz, 2011)

In contrast to this is the dialogue of Hope Dickson Leach's 2016 film *The Levelling* (Sound Designer and Re-recording Mixer - Ben Baird). Film critic Mark Kermode makes explicit reference to the tempo of the dialogue on BBC Radio 5's *Kermode and Mayo's Film Review* show:

> It's about people failing to communicate verbally and there are great gaps between what they are saying; and it's in those gaps

> and it's what is happening in those very loud silences, the silences in which all that stuff [is] going on in the background, the sound of the farm, the sound of the insects. […] It is a film about the space between words […] a film that is absolutely built from the soundtrack upwards. (Kermode and Mayo, 2017)

And then there is the most challenging work for a dialogue editor: overlapping lines. The 'where', 'when' and 'by how much' of the overlaps all contribute to setting the pace of the final dialogue track.

Regarding a less constrained, impromptu dialogue delivery by actors, Robert Altman's style of using multiple personal radio microphones instead of boom operators on scenes containing many characters broke new ground in films such as *Gosford Park* (2001) (Sound Designer Nigel Mills, Re-recording Mixer Robin O'Donaghue). Here, it was technology – specifically the use of 24-track audio recorders on set – that enabled the Director to work in a freer fashion than his predecessors would have been able to. Actor Clive Owen was one of the cast of *Gosford Park*. Owen recalls:

> He [Altman] said: 'Stop. Actor says line, actor says line. Nightmare.' So he sent Derek Jacobi through the middle of the scene, chasing a dog or carrying a tray or something, just to mess up the neatness of it all. I've worked with directors who, if you put more than a few people in a scene, they're like: 'How am I gonna do this?' Now look at Gosford Park. Twenty people in a room, each with their own thread and it looks like he [Altman] just happened to catch it all. It takes an amazingly smart brain to do that. (Gilbey 2015)

Certainly a Director with a smart brain; but equally, one supported by an attentive Re-recording Mixer, who decides who the audience actually listens to at any particular point in the mix.

The Spatial Sound area is concerned with both the positioning of sounds within the soundfield of film and television programmes, *and* the space placed

around the presented sound: from the convention of on-screen, front Centre-focussed monophonic dialogue, the front Left-Right stereophonic imaging of events to the left or right of the projected image, through to enveloping atmospheres placed in the surround channels, or specific out-of-vision sound effects, spot effects or dialogue, behind, or, (in the case of proprietary playback systems such as Dolby Atmos[7] or DTS: X[8]), above the audience. Almost all sounds inherently display some kind of spatial characteristic, but they will only be considered as part of the Spatial sound area when this characteristic is their most important sound design aspect.

This concept of any sound being considered part of a particular sound area *depending on its primary emotional value to the soundtrack, or its contribution to a deeper understanding of the plot* is fundamental to gain most benefit from using the Four Sound Areas framework. So comparing how a similar sound may used for effect in the different sound areas may be illustrated by the sound of a pack of dogs barking.

As an example of Narrative sound, picture a scene in which a prison inmate is seen cutting stealthily through a perimeter wire fence, under the cover of darkness. The sound of dogs suddenly barking immediately suggests to the listening-viewer the danger of the prisoner being discovered escaping; and the Re-recording Mixer is likely to balance the sound of the dogs for prominence in the mix.

Conversely, the sound of dogs excitedly barking in a countryside setting, where in the background we see a local fox hunt assembling (but not serving as

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[7] Dolby Atmos was launched in 2012 and adds height to the surround sound capabilities (the Spatial sound area) of a soundtrack, through the use of dedicated ceiling speaker feeds. It represents an opportunity for sound designers to create a true 3D soundfield, with sound 'objects' mapped to move ('pan') around the available theatre speaker array, although ambient sounds and dialogue that do not move dynamically in the soundfield are still mixed conventionally. Professional Atmos systems in mixing theatres and movie theatres support up to 128 sound channels and 64 speaker feeds. Blu-Ray soundtracks require a separate mix from Theatrical master soundtracks for Dolby Atmos Home Theatre set-ups, which currently support a maximum of 24.1.10 (surround / LFE / ceiling) channels. For home use, a spatially-coded sub-stream is added to Dolby Digital Plus or Dolby True-HD soundtracks.

[8] Dolby Laboratories' commercial rivals DTS launched its own version of height-enhanced surround sound called DTS: X, in 2015, which promised a distinct advantage for post-production budgets: DTS master soundtracks are compatible with all down-mixing requirements, removing the need for costly re-mixing for home theatre formats. Whilst DTS Home Theatre supports 11.2.4, most home receiver manufacturers are standardizing on the 7.2.4 configuration to prevent a costly 'format war.'

the main feature of the scene or shot), would be considered in this instance to be part of the Abstract sound area: it is helping to ‘set the scene’; and the Re-recording Mixer is unlikely to make this sound prominent in the mix, so long as the hunt is in the background.

But it might be that it is the speed of the dogs barking – the decisive factor of the Temporal sound area – that has most relevance for a scene. Imagine a manhunt is seen assembling on screen. When the baying dogs are featured on-screen and the tempo of the barking is fast and furious, it suggests within them a state of high agitation; and an obvious urgency for them to track and seek out their quarry. On the other hand, slower, more punctuated barks might be used in a plains or prairie agricultural scene, where the dogs are more placid, considered and workman-like in their actions of helping Cowboys in the process of rounding up livestock. But in either of these instances – whether it is fast or slow barking – it may be that the Re-recording Mixer chooses to make this Temporal sound the prominent sound in the mix.

Finally, a stylised, Spatial characteristic reverberation could be applied to the dogs barking, providing a clue to their out-of-shot proximity; e.g. the listening-viewer may infer that the dogs are in an adjoining alleyway, across a valley, inside a vehicle or within a room; and this aural suggestion is something that the Re-recording Mixer may choose to emphasise in the mix.

In a nutshell, Narrative and Abstract sound areas may be said to be concerned with the nature and meaning of sounds. The Temporal sound area is concerned with the soundtrack’s tempo, measure or meter; whilst the Spatial sound area is concerned with the positioning of, and the perceived space around, sounds within the auditioning soundfield. It is important to note that the Narrative sound area does not merely need to contain dialogue - in the same way that the Abstract sound area does not necessarily only have to contain sound effects.

Summarising the semantics of the Four Sound Areas, a sound can only really be in one of two states, irrespective of what sound area it is conceptually designated by at any given moment. That is to say, it is either conspicuous in

the mix, or it is in the background of the mix; because the purpose of any individual sound is either to be noticeable or subtle at a given point in the soundtrack, as suggested by the Sound Designer and implemented by the Re-recording Mixer. So, for example, a piece of music that displays both Abstract and Temporal qualities, or a sound effect that displays both Narrative and Spatial qualities, when mixed for its *emotional purpose*, should be considered as belonging to the sound area that contributes the most to produce the *emotional intent* chosen by the Sound Designer.

Emotion from Narrative sound can be derived from the listening-viewer's empathy with the sentiments expressed by an on-screen character, and the manner, inflection, rhythm and pace with which the words are delivered (e.g. the desperation expressed by Count Almásy in his attempts to persuade British soldiers to help him rescue his injured lover Katherine Clifton, in *The English Patient* (Minghella, 1996) or the robotic, (yet recognisable in human terms), distressed and plaintive calling of Eve, as companion robot Wall-E remains gravely unresponsive in the eponymously titled movie (Stanton, 2008). (Sound Designers – Walter Murch and Ben Burtt, respectively).

Whilst the spoken word predominantly presents in the front, centre playback position, other Narrative sound area sounds, when moved around the soundfield, can be deployed to evoke a significant emotional reaction in response to a symbolic or signalling sound, out of frame or behind the listening-viewer (e.g. a door-knock or door-bell, a gunshot, a siren, a ringing telephone, an animal's roar, a hissing or rattling snake or a snapping twig.)

The visceral nature of some sounds (particularly when forming part of the Narrative sound area) can also bring about extreme reactions: a certain section of Danny Boyle's 2010 film *127 hours* (Sound Designer - Glenn Freemantle) caused the reporting of multiple instances of fainting within audiences world-wide. One on-line critic wrote:

> The cracking sound effects really make you cringe. (Yahoo, 2011)

While Daily Mail reviewer Chris Tookey claimed *127 Hours* is:

> […] the most harrowing, bone-breaking amputation scene in the history of cinema. (Tookey, 2010)

Emotions from sound in the Abstract sound area can be derived from experiencing abstract and atmospheric environmental sounds of the scene in question, the emotional effect of which may be increased through the use of the whole soundfield; as if the audience is within the same location as the on-screen characters. Obvious examples of mood-setting could be in the form of a sense of peace and safety suggested by the sound of songbirds, a sense of wariness from the presence of wind effects, or a sense of foreboding from the sound of an approaching storm.

Emotion from Temporal area sounds will often (but not exclusively) be derived from elements that demonstrate qualities of musicality; and where unambiguous musical score, cues and motifs do appear, their use is usually as originally derived from musical theatre. Its early adoption to synchronized talking-pictures meant that music was often used as:

> […] a means to track a character both physically and emotionally throughout a narrative. […] this approach can be both emotive (conveying to the audience how to feel) and functional (providing a form of narrative enunciation or commentary.) (Whittington, 2009 pp.40-41).

However, Whittington goes on to suggest that the contemporary use of non-diegetic and diegetic music, or score and source music, has become more refined; with the score music (often forming a part of this study's Temporal sound area) regularly reduced to leitmotifs and used to support a soundtrack constructed principally around a kernel of dialogue (often within this study's Narrative sound area) and atmospheres or room tones (often found in this study's Abstract sound area), which are used to establish a setting or location. Source music however can present to the listening-viewer a sense of era or signifies a specific place that is directly relevant to the plot, often by offering less-intrusive pointers to the storyline. (Ibid.)

The careful combination of both diegetic and non-diegetic music can also add an extra depth and sophistication to a soundtrack: e.g. when a contemporary non-diegetic score is worked around examples of period diegetic music that are being used to suggest a familiar, yet past, setting.

Taking this melodic complexity a stage further, according to the Four Sound Areas framework, music with lyrics could be said to demonstrate Narrative, Abstract, Temporal *and* Spatial sound area characteristics: e.g. when the sung lyric is used as part of the Narrative sound area; or the melody providing the contours of the song suggests an Abstract, less codified message; or the time-signature of the music itself is used to determine the Temporal nature of the scene; or the Spatial acoustic setting of the music suggests a distinct sense of place or environment. However, it's conceptual 'home' within the Four Sound Areas at any one point will be determined by its primary purpose in the soundtrack.

The last of the Four Sound Areas is Spatial. This is by its nature a very versatile element of the soundtrack, in as much as it can be directly applied by the Sound Designer or Re-recording Mixer to support or reinforce the other sound elements contained within the Narrative, Abstract and Temporal sound areas. This may be achieved through the use of artificial reverberation added to a sound, to alter the 'acoustic' setting a scene is played in (the processed signal being the Spatial sound area element, as opposed to the clean, original sound); or the addition of discrete sounds in surround channels to signpost a sense of place in filmed drama: e.g. birds and bugs to suggest 'outdoors'; or specific sound sources such as crowd microphones placed at an Outside Broadcast for instance, which are used to convey audience and arena size in the context of a sporting or musical event.

It is important to note that the use of the Spatial sound area is not channel-dependent i.e. limited to the surround channels of a delivery platform such as Dolby Digital, configured for 5.1 or 7.1 playback. Indeed, Spatial sound area content may equally be applied to good effect in a monophonic soundtrack presentation. And so in this way, the three separate, yet inextricably linked, Narrative, Abstract and Temporal sound areas are component parts of a

soundtrack, bound together into a cohesive whole through the considered use of the fourth element, the Spatial sound area. However a sound is considered to be part of the Spatial area if the main characteristic through which emotion is portrayed is its spatial characteristic.

Finally, it would be remiss to not mention the *absence of sound* as a sound design and mixing tool. Certainly as far as motion picture sound is concerned, silence is the beginning (and end) of all audible sound within a soundtrack; and therefore the quiescent state of all of the Four Sound Areas[9].

Total silence, as opposed to an extremely low effects track that is barely audible, is rarely used (indeed, in broadcast television, the presence of total silence in a submitted programme is a trigger for failure of the pre-transmission Quality Control test) and is not the focus of this research. It is however, a powerfully evocative option for the cinema Re-recording Mixer.

The use of silence in the film *The English Patient* (1996) by the film's Sound Designer and Re-recording Mixer Walter Murch is described in Michael Ondaatje's book *The Conversations*. He relates how silence is used in the memorable interrogation scene:

> When Caravaggio says, "Don't cut me," the German pauses for a second, a flicker of disgust on his face. […] We see the look on the German. And now we know he has to do what he was previously just thinking about. To emphasize this, Murch, at that very moment, pulls all the sound out of the scene, so there is complete silence. And we, even if we don't realize it as we sit in the theatre, are shocked and the reason is that quietness. (Ondaatje 2004, introduction p.XX)

The shock of silence within modern, fully-filled sound tracks can be as striking as any sound effect; and even in older, monophonic soundtracks, such as Bergman's *Winter Light* (1963) the fact that silence is so unnatural in real life

[9] Respectfully acknowledging both the philosophical standpoint of Parmenides 'Nothing comes from Nothing' *(ex nihilo nihil fit)* or the quantum physics theory regarding 'nothing' as being an unstable quantum vacuum containing no particles.

grabs and focuses the audience's attention on the screen. Whilst a single effect e.g. the repeated popping of a photographer's flash bulb at the end of *Rear Window* (1954) (Dir. A. Hitchcock / Re-recording Mixer Loren Ryder) or a 'near-silence' left hanging in the air during a dramatic moment e.g. in *Mission: Impossible* (1996) (Dir. B. De Palma / Sound Designer and Re-recording Mixer Gary Rydstrom) Tom Cruise's character Ethan Hunt is lowered head-first into a high-tech vault that has an alarm triggered by any sound that rises above a certain threshold[10]. (Wright 2008)

Moments of complete cinematic silence are few and far between, but an example of absolute silence occurs in Martin Scorcese's *The Aviator* (2004) (Re-recording Mixer Tom Fleischman):

> After Hughes (Leonardo DiCaprio) has locked himself in his office and he begins to hallucinate, Scorcese pulls the sound of the scene. Hughes is naked, watching his own films on a loop. We stare at Hughes in a medium-long shot and as he sits in his chair the sound track goes mute. Not even the sound of the projector. Not even the sound of Hughes breathing. Nothing. It's a stark moment because at this point he has sunk so low into depression and sickness that he [is] finally alone. The silence lasts for only a few seconds, but its presence is hard to ignore. (Ibid.)

Whilst the occurrences might be scarce, the total absence of sound at key moments in a film is an effective tool for the Re-recording Mixer to create or emphasise intrigue; engaging an audience and focussing their attention to events unfolding on-screen.

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[10] The vault scene in *Mission: Impossible* (1996) surely owes a great deal to the near-silent scene of a much earlier film: *Rififi* (1955) (Dir, Jules Dassin / Re-recording Mixer Jacques Lebreton) a French 'Heist' film that puts a cleverly constructed soundtrack to use during the near-silent 'breaking-in' sequence.

5.3 The alignment of the Four Sound Areas with existing sound design theories

This thesis suggests that the concept and practicality of breaking down a soundtrack into the four designated Narrative, Abstract, Temporal and Spatial sound areas can offer Sound Designers and Re-recording Mixers a useful and novel framework to work with; one that avoids considering the evoking of audience emotions solely by sounds traditionally categorised under a general heading of ‘sound effects’: e.g. the frequently heard use of thunder to signal a scary scene, or the use of twittering birds to denote a peaceful scene.

Instead, this framework allows for the consideration that it is not just specific sounds, but the whole of the audio mix and its level balance that contributes towards the evoking of audience emotions; and that suitably arranging these elements is something that Sound Designers and Re-recording Mixers are in full control of at the track laying and mixing stages; where they add their creative, and emotional, interpretation.

In this sense, whilst still ordered, it is intended that this Four Sound Areas framework should be a freer, less constrained way of considering sound elements than the traditional audio post-production stem categories of ‘dialogue’, ‘music’ and ‘effects’, therefore allowing Sound Designers and Re-recording Mixers to more easily ‘make the soundtrack of the world and the voice of the living heard.’ (Serres, 2012)

5.4 The rise of emotionally expressive Sound Design

Even after the introduction of the first stereophonic, magnetic soundtracks in the 1950's, many U.S. independent theatre chains resisted upgrading their noisy, monophonic optical equipment on cost grounds until well into the late 1960's; even at one stage petitioning major studios such as Warner Bros. not to upgrade their audio playback formats. (Whittington, 2009)

Indeed, some thirty years after the release of the first ever multi-channel soundtrack, by Disney (*Fantasia*, 1940; Sound Recordist William E. Garity):

> The frequency range and quality of sound in most cinemas was not much better than that of telephones and continued to remain so until the mid-1970's […] until the arrival of Dolby. (Sergi, 2004, p.14)

It took the introduction of the Dolby Stereo soundtrack in the early 1970's, with its Type-A noise reduction and inherent mono-compatibility, to convince reluctant theatre owners to raise the playback quality within their cinemas to something more akin to the listening experience available through high-fidelity FM music-radio services and stereo record players, that by then, were already in widespread use by the general public. The contemporary cinema-going population had come to expect more from a film soundtrack, given that the advances in both music reproduction equipment and the wider sound production values afforded to popular music such as The Beach Boy's *'Pet Sounds'* or The Beatles *'Sgt. Pepper'* albums; both of which carried extensive non-musical sound content, in the form of sound effects designed to enhance the listening experience, resulting from the technology and experimentation that flowed between the two popular media of music and film. (Whittington, 2009)

The more subtle use of the surround channel in cinema audio mixing emerged sometime after the introduction of Dolby's Surround Sound[11] technology in the late 1970's; at a time when the novelty of science-fiction films with their 'seat-shaker', low frequency effects (LFE) channel, and the front-to-back swoosh's of spaceships, lasers and rockets – made possible by Dolby Stereo[12] – had begun to wane. Now Sound Designers and Re-recording Mixers were more able to stimulate the audience directly, by routinely delivering more

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[11] Dolby Surround Sound was first tested on the movie *Superman* (1978) and *Apocalypse Now* (1979) was one of the first formal releases in cinemas with three channels in the front (Left, Centre, Right) and two in the rear Left surround, Right surround). There were typically five speakers behind the screens of 70mm-capable cinemas, but only the Left, Centre and Right were used full-frequency, while Centre-Left and Centre-Right were only used for bass-frequencies.

[12] The term Dolby Stereo was first used for the 1976 release of 'A Star is Born'. The four-channel magnetic audio track occupied the space on 35mm film stock previously utilised by the single monaural optical soundtrack. It carried a front Left / Right stereo channel and a front monaural Centre channel for speakers behind the screen and a monaural Surround channel which was used to feed speakers the sides and rear of movie theatres. Significantly, Dolby Stereo also utilised the Dolby A-type noise reduction system that enabled sound designers for the first time to contemplate the use low-level sound.

prolonged periods of ‘background’ sound all around the suitably equipped movie theatres. Listening-viewers were also now occupying an auditioning environment that was affected by enveloping and conditioning soundscapes, and it gained momentum by becoming an integral part of the soundtrack expectations of big budget feature films, as well as garnering the attention of film sound theorists. Whittington wrote:

> For the most part, traditional sound theory does not respond to the new needs of sound analysis, primarily because it does not envision the complex production capabilities of the modern dubbing stage, or the use of multi-channel sound formats […] (Whittington 2007, p.8)

A situation that the Four Sound Areas framework attempts to redress.

The widespread adoption of multi-channel recording and playback formats has broadened the canvas for both Sound Designers and Re-recording Mixers; and cinema sound is no longer limited to emanating from behind the screen, or constrained by the framing of the picture. The immersive capability of surround sound lends itself well to the placing of atmospheric sounds all around the audience and these enveloping atmospheres can be put to good emotional intent.

As Sonnenschein suggests:

> Environmental sounds like water can produce a feeling of cleansing, awakening, while wind can provoke a sense of lack of direction, perhaps a place or moment not to be trusted. (Sonnenschein 2001, p.205)

An example of this is the use of desert wind in Sound Designer and Re-recording Mixer Walter Murch's soundtrack for *The English Patient* (1996):

> The desert is a vast place. When you're there, the feeling it evokes is psychic as well as physical. The problem is that if you record the actual sound that goes with that space, it has nothing

> to do with the emotion of being there. In fact, it's a very empty, sterile sound. The trick in *The English Patient* was to evoke, with sound, a space that is silent. We did it by adding insect-like sounds that, realistically, would probably not be there... Also tiny sounds – as tiny as we could get – of grains of sand rubbing against each other... We took those tiny things and made a fabric out of them. (Théberge 2008, p.54).

Desert wind is often put to work by Sound Designer and Re-recording Mixer Skip Lievsay. His use of subtle wind induces an aching sense of loneliness and vulnerability into the sound design of Joel and Ethan Coen's *No Country For Old Men* (2007); and the understated and suggestive use of wind in the surround channels can be heard to similar effect in Lievsay's other soundtracks for desolate and dark Coen Brothers films, such as *Fargo* (1996), *A Serious Man* (2009) and *True Grit* (2010).

Sounds from the Abstract sound area that are placed in a surround channel often consist of three major elements of the stochastic, natural soundscape, summarised by Treasure as 'Wind, Water and Birds.' (Treasure, 2007). But not all sounds originally heard in the Abstract sound area will necessarily remain fixed in that domain; in some instances, for emotional effect, an Abstract sound area leitmotif can eventually be resolved to the Narrative sound area; and a skilled practitioner can use this to great effect.

In the Steven Soderbergh film *Erin Brockovich* (2000), Sound Designer and Re-recording mixer Larry Blake fashioned a leitmotif from an indistinct and distant heavy generator hum, which was present in the soundtrack whenever scenes showed locations and homes close to a particular power generation plant. Erin Brockovich, a humble legal clerk, has proof that the operator of the plant, the Pacific Gas & Electric company, knew that their power station was leaching the toxic chemical Hexavalent Chromium into the local water supply, resulting in some residents facing debilitating and fatal illnesses. Her struggle is to convince locals who have unwittingly been bought-off by the corporate giant to join with her, to bring about a legal class action. At the precise moment that Erin Brokovich finally gets a local mother, helplessly watching her child die from

Chromium poisoning, to understand that the Pacific Gas & Electric Company are culpable for her child's demise, the sound of the power plant - seen in the distance - vents a subtle, human-like sigh before diminishing in level.

In the terms of this research, Sound Designer and Re-recording Mixer Larry Blake moved a significant component of the soundtrack away from the Abstract sound area (the humming of the power plant's 'voice' was sat 'back' in the mix up until this point) towards a place in the Narrative sound area, and a prominent level in the mix. Emotionally, the 'sigh' of the power plant's 'voice' is introduced to signal to the audience that at last the Mother understands the true cause of her child's incurable condition. A further assumption is that the intended emotional effect on the listening-viewer is to increase the emotions of sadness and compassion already felt, and increase the intensity to evoke emotions associated with disgust and anger.

5.5 The framework and its use by the sound department

To initially depict the relationship between the Four Sound Areas, a simple 3-dimensional representation was produced (*Figure 2*). Whilst the two sound areas of Narrative and Abstract are shown at opposite ends of the same axis (as both of them carry 'meaning') it is important to note that these two sound areas are not merely antonyms of each other; they are distinctly different in their function and therefore each warrant their own sound area. Whilst this representation is designed to help visualise the sound areas, it is not designed to represent an actual, well-defined multidimensional space; rather, this is provided as a useful way to "imagine" the Four Sound Areas, and also as a way to communicate the framework to others.

The Temporal axis ranges between, at one end, possessing a complex rhythmic structure that is fast paced and at the other end a low-complexity, slow paced rhythmic structure.

The Spatial axis ranges between describing a sound with a single channel presentation at one end and multiple channel presentation at the other.

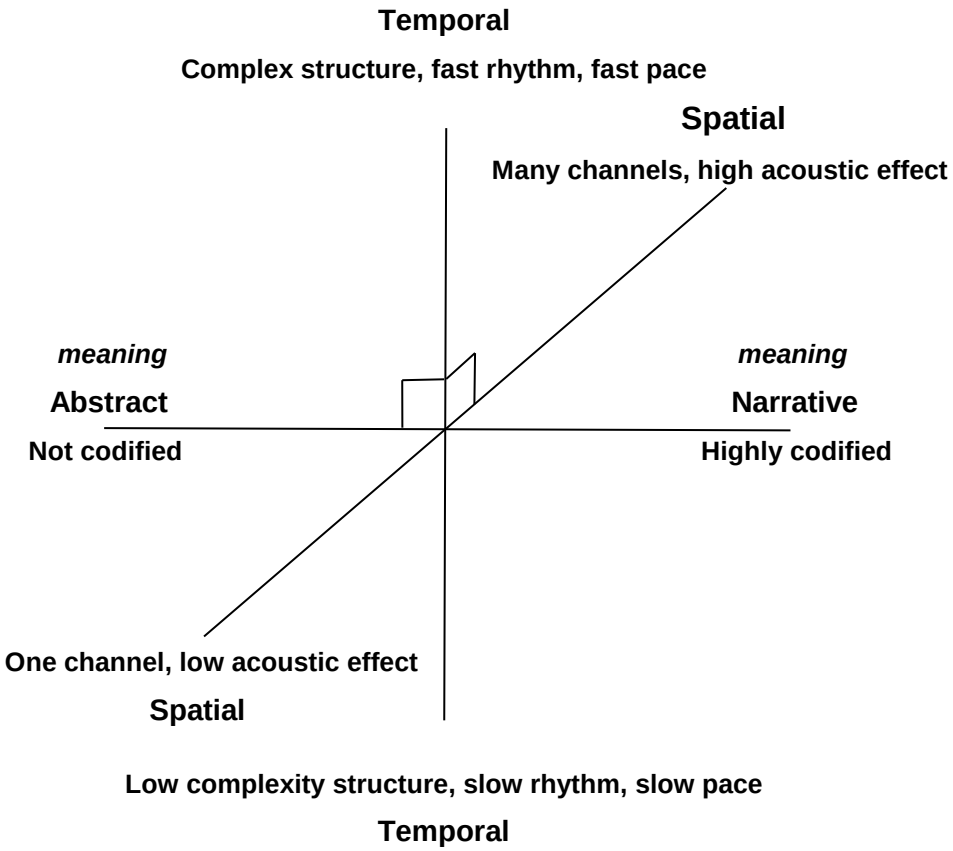

Figure 2 - A simple 3-axis model representing the suggested Four Sound Areas. Abstract and Narrative sound areas are shown on the same axis, but they are sufficiently distinct within an audio mix to warrant their own distinct sound areas for describing the evoking of particular emotions. [13]

Whilst the decision over the *type* of sounds put forward for use in a soundtrack is that of the Sound Designer, their relative *balance* within the sound mix is always set by the Re-recording Mixer (although as noted earlier, increasingly, the Sound Designer and Re-recording Mixer can be one and the same person).

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13 It was interesting to consider *en passant* (although not explored to any significant extent as it was felt to be outside of the research guidelines for this PhD by Practice) to what extent there might be correlation and relevance to the broader scope of the Congruence-Associationist Model proposed by Cohen (2006), adapted to take account of the five significant domains espoused by the French film theorist Christian Metz (described in Stam (2000), p.5 and p.212), namely: visual scenes, visual text, speech, sound effects and music; where the concept includes the listener constructing a narrative from the information gleaned from both the visual and the auditory channels. (Ibid; pp.892-895)

Expressed succinctly by Thomlinson Holman, the job of the Re-recording Mixer is ultimately about

> […] getting the right sound, in the right place, at the right time. (Holman 2002, p.172).

And given what has been discussed in this thesis with regard to the Re-recording Mixer's creative responsibility, it may be appropriate to respectfully add the codicil 'and at the right level'.

5.6 Recognising the Four Sound Areas in pre-existing soundtracks

As part of this study's literature review, three major feature films, each with notable sound design, were reviewed to identify instances where the Four Sound Areas proposed by this study might be considered as already being 'heard' in use.

Whilst the two feature films used in the Listening Tests of this study - *The Craftsman* and *Here and Now* - are from the contemporary independent British film sector, as a practitioner, the author contributes to a wide variety of moving-picture projects (ranging from UK and US 'indies', to more mainstream Hollywood studios); and the Four Sound Areas framework is intended to be relevant and applicable to all moving-picture soundtracks regardless of oeuvre, genre or budget. Therefore, the intention for the selection of the three movies that form part of the Literature Review was to draw on diverse examples of narrative filmmaking (including one in a foreign language); enabling the examination of the existence and relevance of the Four Sound Areas in pre-existing titles to take place in a broader context than any one sector or period of film production could offer.

During their editing and mixing stages, each of these three films would have been constituted in the traditional way from dialogue, music and effects stems; however, this retrospective analysis of soundtracks was undertaken to show how this research's Narrative, Abstract, Temporal and Spatial classification of sounds can be used not only for designing and mixing soundtracks, but also for the purpose of soundtrack analysis.

5.7.1 *Winter Light* (1963)

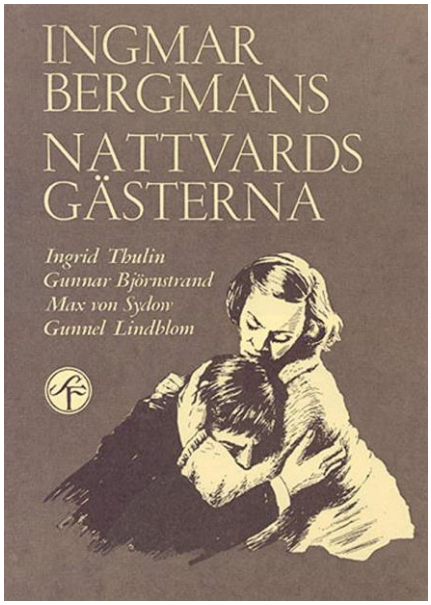

Figure 3 – Winter Light (1963).

Director Ingmar Bergman filmed *Nattvardsgästerna* (Eng. *Winter Light*) (Sound Designer Evald Andersson / Re-recording Mixer Stig Flodin) between November 1961 and January 1962 and it was released in February 1963. It is the second in a trilogy of films written and directed by the Swedish *auteur* that began with *Through a Glass Darkly* (1961) and ended with *The Silence* (1963).

With a running time of just over 80 minutes, this is one of the shortest of Bergman's feature-length films and helped contribute to a heightened sense of unease that ordinary people were feeling at the time, living in post-war Europe and a world still coming to terms with the cold war, atomic bombs and the breakdown of traditional social norms; disconcerting themes that were being explored and exploited in other movies released around this time, such as *On The Beach* (1959) (Dir. Stanley Kramer / Sound Designer Walter Elliott), *La Notte* (1961) (Dir. Michelangelo Antonioni / Sound Designer Claudio Maielli) and *Dr. Strangelove* (1964) (Dir. Stanley Kubrick / Sound Designer John Cox).

Winter Light has a stark and economic soundtrack, monophonic and deceptively simple in presentation; yet one that at times is bluntly expressive

with its use of sound effects and atmospheres, and equally confronting in its use of total silence for dramatic effect. Its black and white pictures reveal its vintage and are as obvious a contrast to the colour of *Apocalypse Now* and *Dogville* as the disparity is between their richer multi-channel soundtracks and the stripped-bare, single channel source of *Winter Light*.

The film opens with the sound of a single chiming bell, at first calling the faithful to worship and then the church clock chiming the hour of 11 (in the Narrative sound area, firstly signalling a church and then announcing the time of day) at the rural Swedish church of Mittsunda. The turnout is low. Four of the attendees are regulars; the other three have objectives other than ecclesiastical for seeing the middle-aged presiding Pastor, Tomas Ericsson. The camera singles each attendee in turn as the first hymn is sung (predominantly used for its Temporal quality, the music setting the tempo for the Eucharist ritual dialogue that will follow, as well as the pacing of the cuts.)

Märta Lundberg is in love with Tomas and they have been uncomfortable lovers. Being present at the service means she can be close to Tomas. The other two people with matters on their mind are a young wife, Karin Persson, and her fisherman husband, Jonas.

Tomas is miserably tired, feeling ill with influenza and also troubled by a persistent cough. The cough becomes a leitmotif for Tomas's character; it is a Narrative sound area sound that reinforces and serves to remind the audience of his weakened physical and mental state. After the service, when the visiting hunchback Sexton of the nearby village church at Frostnas, Algot Frovik, asks to speak with Tomas regarding an urgent personal problem, Tomas dismisses him abruptly, saying they will maybe discuss the matter later, perhaps after that afternoon's vespers service at Frovik's church in Frostnas.

Tomas receives the Perssons somewhat more civilly when they enter the vestry; Karin, who is pregnant with their fourth child, asking if Tomas would speak with Jonas in private. Jonas is uncommunicative and in a state of silent anxiety and deep depression, the root of which Karin explains is his learning that the atomic bomb is now available to the Communist Chinese; and as he

believes they are brought up to hate the free West, for him it is only a matter of time before they deploy their deadly missiles. Karin hopes that as a man of God, Tomas may be able to explain some higher purpose behind all of this, to help Jonas come to terms with what he is feeling. ‘We must put our faith in the Lord’ ventures Tomas as a platitude, but a scornful look from Jonas ensures that any further conversation remains stilted, with Jonas remaining silent throughout. By the time Tomas tells them ‘I understand your anguish, but life must go on...’ the meeting comes to a close on an inescapable note of foreboding; and Karin asks Jonas to drive her home so that he may return within 30 minutes to talk again, more privately, with Tomas.

The passage of time is an important element of this story (it takes place over a short period of time, possibly only four hours; an equivalent time to that which Christ suffered on the cross, Frovik will later comment) and the physical manifestation of this, represented by the grandfather clock, is a consistent part of the soundtrack in the vestry scenes. At various times the ticking takes on an abnormal prominence akin to hammering, or reduces to the faint hint of mechanisation as if heard from a pocket watch. In doing so it moves between the Abstract sound area (when it sits low in the mix) and the Narrative sound area (when it is exaggerated, suggesting a head-thumping, feverishness in the sickly Tomas) e.g. **[DVD 00:14:45 – 00:15:05 and 00:17:22 – 00:17:52]**

As the Perssons leave, Märta enters, thoughtfully bringing Tomas a flask of hot coffee and sandwiches. Ungratefully, Tomas tells her he already has his own coffee and then they begin to bicker; the central theme being how Tomas is unkind to her whatever Märta does to please him.

In the interval between Märta leaving and Jonas returning, and after spending some time looking at photographs of his dead wife to the prominent accompaniment of the clock (Narrative sound area; symbolising that time has moved on since her death, even though he hasn’t) Tomas reads a letter, in which Märta desperately offers her love to him as a consolation for his lack of trust in God. The letter is read for the audience to eavesdrop, by Märta in an almost prying close-up shot. There are no visual or audible distractions; her voice is rooted firmly in the Narrative sound area as she explains herself.

[DVD 00:26:50 – 00:34:16]

Jonas is late; so Tomas pushes the letter aside and falls asleep. When he eventually returns, Tomas wakes to find Jonas standing over him. He has entered not with the sound of a door opening or footsteps on what must be a hard, stone floor, but instead to the loud ticking of the grandfather clock again (Narrative sound area; signalling the importance of the situation: time is literally ticking away for Tomas to save Jonas.) The ticking grandfather clock is an important part of the sonic fabric of the vestry: conspicuous when in shot, subdued when not; but when it is emphasised to the point of being overbearing (e.g. when Karin and Jonas Persson first talk with Tomas, or whilst Tomas looks at the photographs of his dead wife before reading Märta's letter) it is only at a high volume level in between, or in the absence of, dialogue e.g.
[DVD 00:25:35 – 00:26:50]

Tomas's first perfunctory, counselling-style questions are clearly unproductive; and so instead Tomas embarks on a discourse about his own crisis of faith. This is clearly of no comfort to Jonas, who leaves without a word. The sound is intentionally taken down to complete silence as Jonas leaves; and the soundtrack not only becomes devoid of clock-ticks, footsteps, hinge squeaks or the vestry door shutting, but it also removes the baseline of any interior dialogue scene: a room tone that might contain a faint winter wind blowing through the cracks and gaps in the church doors and windows. This unnatural, complete silence is held for an uncomfortable 30 seconds.
[DVD 00:40:47 – 00:41:17]

After Jonas has left, Tomas breaks the silence to ask: 'My God… Why have you forsaken me?'; but then the soundtrack returns once more to complete silence, for a further uncomfortable 44 seconds. Leaving the vestry to re-enter the church, he collapses at the altar, weak from his 'flu; it is his staccato coughing fit that pierces the slow measured pace of the preceding shots. But Märta is lurking, waiting for him. Pleased for the opportunity to cradle, kiss and comfort him in her arms, Tomas lies limp and unresponsive to her affection as Märta murmours her love for him, until they are disturbed by the sudden entrance of Magdalena Ledfors (the old Widow seen earlier in the

congregation) who blurts the tragic news that Jonas Persson has just been found dead by the river. He has taken his life with his own gun, shooting himself in the head. Tomas immediately assumes his duty as a clergyman, coldly shrugs away his Mistress and pausing only to collect his coat and boots, he leaves for the river, leaving Märta figuratively, and literally, behind him. The sound of his car engine firing as he prepares to make his exit is made prominent in the mix (a significant Narrative sound that tells us the urgency and importance of Tomas's journey, set against the added Abstract area atmospheres and the actual location sound.)

A Policeman is already at the scene and Tomas is asked by the Detective to stay with the body until the infirmary van arrives, whist he takes Jonas's gun to the Police station. Alone with the body, we sense what Tomas must surely feel: he has been, and continues to be, useless to the situation. Märta arrives in her car and rushes to Tomas, but he sends her away from the covered body. The infirmary van arrives, quickly collects Jonas's dead body and leaves.

Throughout this scene of the suicide on the river bank, which is visually covered in long-shot, the sound is swamped by the unnaturally loud atmosphere of the rushing river (emphasised and forming a part of the Temporal sound area, signalling that the speed of events has overtaken everyone) and this maelstrom intentionally drowns out almost every other sound (dialogue, footsteps, clothes rustle, engine noise and door slams are all intentionally submerged beneath the unnaturally loud and disconcerting sound of the fast flowing river). We are eavesdroppers to a difficult situation, albeit from a distance, but it is nonetheless uncomfortable to hear so little of the events unfolding because of the all-pervasive sound of the river rapids. **[DVD 00:45:04 – 00:49:35]**

Leaving Tomas's car behind at the river, Märta drives him to her home. Although the overwhelming sound of the river is reduced when they enter the car and close the doors, whilst their lips are seen moving, we still cannot hear their voices as they drive off. **[DVD 00:49:05]** At the schoolhouse, Märta prepares cough medicine and aspirins for him and they begin a conversation

that quickly develops into a shockingly cruel annihilation by Tomas of Märta's love and intentions towards him. As viewers we wonder what she has done to deserve such cruelty from his lips; and once more we eavesdrop as embarrassed bystanders. **[DVD 00:52:02 – 01:00:52]**

Märta is emotionally broken by his verbal onslaught, but she continues to describe the unrequited devotion she has for Tomas, which she hoped she had made clear in her letter to him, when she said: 'I live for you. Take me and use me. Beneath all my false pride and independent airs, I have only one wish: to be allowed to live for someone else.' Her defence of this hopeless devotion is reminiscent of the lovelorn Helena justifying herself to Demetrius, in Shakespeare's *A Midsummer Night's Dream*:

> The more you beat me, I will fawn on you.
> Use me but as your spaniel – spurn me, strike me,
> Neglect me, lose me. Only give me leave,
> Unworthy as I am, to follow you.
>
> (Act 2, Scene 1, page 8.)

She has been made to endure the cruellest tirade yet from Tomas and the situation has become a mid-winter nightmare for Märta – she realises that her life with him is untenable, but without him it is unthinkable.

When he is spent, in the quiet aftermath of them both recovering and coming to terms with what has been said, it seems that Tomas has realised he has stepped over a line of common decency, particularly in the way that he has spoken to Märta. He goes to leave – somewhat pompously declaring that he must be the one to break the news to Karin Persson – but he hesitates at the door, and then asks if Märta will accompany him.

Driving to Frostnas church from the bereaved Persson homestead, they travel without speaking and are forced to wait at a railway level crossing: another moment of significant sound design and visual metaphor. The train arrives and passes close to the car as they wait, the goods trucks visually

representing enormous coffins that disappear in the train's smoke and steam as if in a cremation, as do Märta and Tomas; each figuratively lost and alone within the same vehicle. Inside the car, a doubting Tomas, acutely aware of his failure and despair, confides in Märta that it was his parent's dream that he should become a clergyman.

It is the Narrative sound area that is used to convey to the listening-viewer the brutal power of the locomotive engine, causing attention to be directed and focussed on the startling scream of its steam whistle; whilst an Abstract sound area wash – made up of couplings, linkages and chains – provides an appropriate and contextual mechanical underscore.

The Temporal sound area contributes to the scene through the clattering of the railway trucks, their steel wheels on the rails becoming a tumultuous crescendo to the scene; a stark contrast in tempo and volume to Tomas and Märta's subsequent quiet arrival in the village of Frostnas, to the more gentle sound of church bells ringing. **[DVD 01:06:15 – 01:07:33]**

In the vestry at Frostnas, as Tomas prepares for a vespers that no parishioners have arrived for and an audience that consists of Blom the organist, Frovik the Sexton and Märta, Frovik suggests cancelling the service. Tomas dismisses this notion out of hand and is determined that order will prevail. Back in the vestry, the crippled Frovik is finally able to reveal his urgent problem. He has read the gospels as Tomas advised him to, as a way to distract his depressed mind from the constant physical pain he must suffer alone; and he tells Tomas that he has come to understand that Christ's suffering was not so much endured on the cross, because that lasted for just four hours. But instead it was his friends disowning and distancing themselves from him, his crying out in despair that his own father, God himself, had forsaken him in his time of need; and he died doubting all that he had preached. It is a clear analogy that suggests Tomas must examine his own conscience and consider how he has conducted himself as a clergyman.

Tomas instructs Frovik that the service bell should be rung; and just as the film started with a single, forlorn bell from working in both the Narrative and Temporal sound areas, so too the film draws towards its close.

Winter Light is a purposefully bleak film and in helping perpetuate this persistent sense of unease and discomfort, the soundtrack rarely strays from the Narrative sound area: the dialogue, monologue and spot effects all point towards the negativity and despair of the characters and the unresolved and unfulfilled situations they each face. The Abstract sound that appears is often subdued, barely more than room tone fleshing-out the dialogue of interior scenes or low exterior ambience (the level crossing being an obvious exception).

The use of the Spatial sound area is low, too: the church interiors were actually shot in a studio,[14] so the natural reverberation that a microphone would detect when recording in a stone building (e.g. it would be particularly noticeable on voices and footsteps) is absent; and the use of artificial reverberation to compensate for this e.g. at the opening of the film when we first hear Tomas presiding, is balanced carefully in the mix. There is no attempt to balance for perspective when the sound of Tomas preaching continues over exterior shots of the church **[DVD 00:01:45 – 00:02:10]**

The Temporal sound area is served by several sound sources: at it's fastest, the clattering of steel wheels on the train track, at its slowest, the somnolent and doleful church bell; the church organ (there is no score, this is the only music present throughout the film) which influences the tempo of the subsequent dialogue (the dialogue is in the Narrative sound area, the rhythm of which is carefully metered to the point of feeling unusually ponderous at times); the rushing river atmosphere – at odds with the awkward, slow dialogue – is also at a frantic pace; but the metronome of the film is set and re-set by the instances of total silence.

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[14] Filmstaden (trans. *The Film Town*) was a film studio complex situated in Råsunda, Solna Municipality in Stockholm, and the birthplace of some 400 Swedish movies. Built by the main Swedish film producer of the period, Svensk Filmindustri, it was one of the most modern film studios in Europe at the time of filming *Winter Light*. The sets for this film were unusual by virtue of having a false ceiling, which would also impact on the reverberation time of the studio. (The Swedish Film Database).

5.7.2 *Apocalypse Now* (1979)

Figure 4 - Apocalypse Now, 1979.

Apocalypse Now is arguably the most significant film for sound design of modern times, with the on-screen credit 'Sound Montage' given to Walter Murch. He was assisted by several notable practitioners, including Re-recording Mixer Richard Beggs and, at that time, a new-to-the-industry rookie, (now Director of Sound Design at Skywalker Sound)[15], Randy Thom.

Head-of-Department Murch created a soundtrack that would introduce to the film industry the mantle 'Sound Designer', as well as the first commercial 70mm Dolby-encoded soundtrack. By fully exploring the artistic possibilities made possible by Dolby Laboratories' multi-channel audio production system, Dolby Stereo, the audience enjoy a greater involvement through surround sound; and in turn, this helped to pave the way for the widespread adoption of the now ubiquitous Dolby 5.1 standard[16]. (Cowie 1990)

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15 http://www.skysound.com/people/randy-thom

16 The term Dolby 5.1 is the consumer term for the Dolby Digital cinema standard first used on the 1992 release of 'Batman Returns'. It contains six discrete sound channels, of which one is dedicated to Low Frequency Effects (the LFE or 'boom' channel). On cinema 35mm prints, the Dolby digital data is optically placed in line and between the film stock sprocket holes. On consumer products, Dolby 5.1 is the standard audio configuration for DVD and Blu-ray Disc players.

The film broke new ground for sound design in the way that it explored multi-channel mixing. Its complex and dense soundtrack was meticulously planned and executed by Writer and Director Francis Ford Coppola and Murch, who also picture-edited the movie - a dual-role he had previously undertaken on Coppola's films *The Conversation (1974),*and subsequently reprised by completing both picture and sound editing on *The Godfather Part III (1990);* and also with Director Anthony Minghella on *The English Patient (1996),* for which he achieved the unprecedented accolade of winning Academy Awards for both picture and sound editing. (IMDb).

The sound of *Apocalypse Now* moves seamlessly from mono dialogue (contributing to the Narrative sound area of this study), stereo music (contributing at times to both the Abstract and Temporal sound areas of this study), frontally-spread L-C-R narration (again, contributing to the Narrative area) and rear-surround ambience and low-frequency effects (contributing at times towards the Narrative, Abstract and Spatial areas.)

Throughout the film, we are afforded insight into the emotional condition of the principle character Willard; but examples of other characters include one of Willard's boat crewmen, Lance B. Johnson, during his LSD trip whilst under enemy fire (in this study's terms, at this point in the soundtrack there appears to be a high Abstract and Temporal sound area emphasis in the mix - Murch perhaps suggesting emotions of isolation, alienation and hopelessness to the audience) and the US Soldier and marksman Roach, whose hearing is so acute that he echo-locates the position of a taunting Vietcong sniper by the sound of their voice alone. Roach's focussing is signified by the fading-out of the surrounding battle sounds (even though we still see rocket and tracer fire across the sky and movement from actors that previously warranted Foley effects); leaving only the sniper's catcalling. This is rooted in the Narrative sound area - even though we cannot clearly hear what is being shouted, we can understand the tonality and inference of this as a derisive, dangerous sound. By now, Murch has the audience listening to an almost completely Narrative and Spatial soundtrack, (the Abstract and Temporal sound areas are

removed from the mix for effect), leaving the listening-viewer as focussed in their hearing as is Rifleman Roach. **[DVD 03:32 – 04:35]**

Historically, the significance of *Apocalypse Now's* sound design is that it marked a turning point in the way that American studios produced and delivered cinema soundtracks, due in no small part to the multi-channel possibilities afforded to Sound Designers, through the utilisation of Dolby Laboratories' innovative technology:

> In the 1970s and early 1980s, Dolby achieved nothing less than a comprehensive industry-wide transformation, from studio attitudes to sound, filtering through to filmmakers' creative use of sound and audience expectations. (Sergi 2004)

The film opens with the sound of synthesized rotor blades, processed to alter their pitch, tempo and timbre (operating in both the Abstract and Temporal sound areas at first), panned front and rear, and set against images of real helicopters passing through frame in slow-motion (thus transitioning the synthesized rotor 'chops' towards the Narrative sound area, as the helicopters register on screen). The introductory music of a song (further use of sound in the Temporal sound area) is started at a time motivated by shots of Napalm flames devouring jungle, and corresponding to a bleak lyric that ironically begins the film with the words: "This is the end". [**DVD 00:01:13]** With Temporal sound balanced in this way against Narrative sound, Murch begins to demonstrate the range and extent of *Apocalypse Now's* soundtrack.

Emotionally, Murch positions the audience from the outset to expect feelings associated with negativity: particularly pity, sadness, and worry. Later, as the film progresses and the plot develops, these increase in intensity towards feelings more associated with embarrassment, shame and guilt; which ultimately culminate in disgust and anger.

Pictures are overlaid and merged from the flames back to rotary blades, but this time we see that they are the air conditioning ceiling fan of Willard's Saigon hotel room. The distinctive chopping sound of these blades (their pace

and punctuation being carefully designed Abstract and Temporal sound, to remind us of Willard being in the jungle) are re-introduced firstly in their synthesized form, and then seamlessly segued into the actuality of a single, real helicopter engine, (whose nature therefore becomes that of the Narrative sound area), passing close-by and overhead the hotel room, located in down-town Saigon. This transition acts as the vehicle to bring the audience from experiencing the sound of the psychotic imagination of Willard (with its characteristic of Abstract sound area sounds and the rhythmic nature of the Temporal sound area sounds, emphasising an emotion of isolation from the here-and-now, accentuated by the absence of Narrative Sound) and into the 'here-and-now'. Real-world atmospheric sounds of the city (contributed by sounds in the Abstract sound area) filter in from outside of the hotel room. Motor vehicles, traffic-cop whistles, pedestrian murmour, insects and birdsong; some of which will segue back to jungle sounds alongside Willard's thoughts:

> The car horns as frogs, the scooters as mosquitoes.
> (Thom, 2011). **[DVD 03:52]**

The first spoken words heard are Willard's off-screen narration (from the Narrative sound area), and these are presented as being internal; from within his own thoughts. This Narrative sound is set against a quiet backdrop of sounds in the Abstract sound area, with an exterior-to-the-room atmosphere; punctuated by three synchronous, room-interior sound effects: Willard catching a fly (Narrative sound), Willard scorching his wife's photograph with his cigarette tip (Narrative sound) and Willard swallowing a drink (Narrative sound). This emphasis on the Narrative sound area brings about a sharp focus on Willard's words, and the lack of activity in the Temporal sound area acts to uncouple the monologue from the other mix components, removing any sense of distraction or any temporal progression **[DVD 00:04:10]**

In turn, an emotional shift begins to take place at this point in the soundtrack, initiated by the sharp-focus being brought to bear on Willard’s private thoughts: the viewer is emotionally led from a position of uninformed compassion to one of involvement and interest.

The opening act ends with the re-introduction of Abstract sound area sounds that are once more internal to Willard's thoughts; corresponding to his monologue narration and that of a jungle combat-zone he knows all too well. As his narration (part of the Narrative sound area) comes to a temporary conclusion, faster-paced music (utilised by the Temporal sound area) returns. In a frenzy of either drunken or drugged movement (possibly both – the camera has earlier panned across not only a liquor bottle and a glass, but also a spoon), and at the end of badly co-ordinated Martial Art forms and impulsive choreography, Willard punches the mirror. The smashing of the glass we see and hear (sounds from the Narrative sound area), but his subsequent screams of pain and mental torment, we see but don't hear. The scene ends on music alone (utilised by the Abstract and Temporal sound areas). The emotions Murch presents are related to Willard's anger: his rage, fury and loathing; evoking in the listening-viewer emotions related to sadness: anguish, despair and shame. **[DVD, sequence ends at 00:07:16]**

The listening-viewers reference point as to what is 'real' and what is a function of Willard's psychotic imagination is regularly challenged. As the tempo of the score progressively increases to fever pitch (the music working hard within the Temporal sound area), the audience is being conditioned for the confusion and conflicting emotional triggers that are to follow; and as the boundaries between the presentation of external sounds and internal feelings are increasingly blurred, the audience is directed towards emotions such as sadness, fear, anger, surprise and disgust, with perhaps an intention on the part of Murch to evoke within the audience a sense of guilt, set against a background emotion of tension.

Given the Narrative nature of Willard's commentary, the viewer is anchored by the logical thoughts that he clearly and lucidly communicates. Yet intentionally, this familiar language and sense of order is distorted as a chaotic realm of disorientating and ambiguous Abstract sound area sounds intrude on the calm monologue; with a counterpoint of other readily identifiable Narrative sounds. The conclusion to this intense opening act is in fact only the first climax

of what is a carefully arranged manipulation of the viewer's emotional journey, designed masterfully by Murch.

5.7.3 *Dogville* (2003)

Figure 5 - Dogville, 2003.

The Lars von Trier film *Dogville* (2003) (Sound Designer and Re-recording Mixer Per Streit) is a story of deprivation and exploitation, set in the isolated and Depression-hit 1930's American township from which the film takes its name. Not only unusual from Streit's sound design point of view, it is unusual visually. Set-out on a large sound stage, all of Dogville town's locations are simply painted in white outline on a dark studio floor, and minimal scenery and props are used to augment and support the actors' performances.

The film is driven by a narrator who leads us through the prologue and nine subsequent chapters (his monologue a function of the Narrative sound area), initially, against a gentle, but cheerful, background of chamber music (used by the Temporal sound area to set a rhythm and pace for the scenes we see, along with gentle Abstract sound area atmospheres). Within the sparse, stark, soundtrack there are little or no visual sources for the spot effects such as door knocks and shop-bells, or latches, hinges and handles, as the actors

move around the small town - indeed the actors actually mime opening and closing doors, but nonetheless, we hear these Narrative sound area sound effects and Abstract sound area atmospheres as befitting the on-set actions: such as the United States President's address being listened to on a period radio in the Doctor's house (in this study's terms, classified as being in the Abstract sound area, as the words of the President are not important to communicate meaning; what is more important is the sense of period that their sound conveys). Footsteps added by the post-production process of Foley (Narrative area sounds) suggest different surfaces underfoot, and after the initial, idyllic scenes, with their Abstract sound area 'backwash' atmospheres, even the time of the day and season of the year are represented by the authentic sounds of birdsong and insects (which all contribute to the Narrative sound area).

As the film's theatrical tableau unfolds, Narrative, Abstract and Temporal sounds are balanced to both support the characters actions and emphasise the oppressiveness of their progressively enslaving relationship to Grace. The Spatial sound area initially remains a constant; predominantly the reverberation that is a function of the natural decay time of the sound stage that the film was shot in.

Steadily, the feeling of comfort and security suggested by the light wind and birdsong atmosphere 'bed' – which has been the mainstay of the Abstract sound area up to this point – loses its prominence in the mix; and is instead by degrees, replaced with a mood of heaviness and burden. The strength of the wind rises and deepens in pitch and the usual sentinels of safety - the songbirds - stop singing. A storm is brewing, metaphorically, and the balance and nature of the sounds in the Abstract sound area (which includes the atmospheres), relative to the Narrative sounds (which includes the dialogue, Foley and spot-effects) and the Temporal sounds (which includes the music), reflects this. The Abstract sounds not only become lower in the mix, but also oppressive in nature.

As Grace's living conditions worsen, the balance between the Narrative, Abstract and Temporal sounds of earlier scenes, demonstrated by the

relationship between the light, Abstract sound atmospheres, present in the mix alongside the regular and harmonious Temporal sound interludes - in the form of the string quartet musical score - changes; and as the amount of this Temporal content progressively reduces, an increased awareness of the enveloping, chill wind, now more noticeably present in the Spatial area, pervades. Even though overall the Abstract sound area is lower in volume within the mix, compared to the level of light wind and birdsong found in earlier scenes, it fills the space created by the reduced use of the cheerful score (utilised by both the Abstract and Temporal sound areas); and the absence of this happy and hopeful music is in direct proportion to the rising unease that pervades the vindictive syntax of the dialogue (which forms part of the Narrative sound area) that is directed towards, and about, Grace. This contrast may be clearly heard by comparing the Abstract and Temporal sound areas of Chapter 4 **[DVD, commencing at 00:54:58]** with those in Chapter 7 **[DVD, commencing at 01:33:10]**

However, perhaps the most shocking event up to this point is witnessing Grace being raped for the first time **[DVD commencing at 01:30:55]** which corresponds to the soundtrack becoming progressively, and eventually, silent. As the camera zooms out to a town-overview wide-shot, we see her violation being perpetrated whilst the town remains symbolically unhearing and steadfastly uncaring to her plight; Sound Designer Streit suggesting powerfully the emotions of isolation, despair and hopelessness to the listening-viewer.

In *Dogville* it is not only the Narrative sound area that is the primary pointer to the intended emotions of Streit's soundtrack, or the setting of its moral compass. It also actively involves the Abstract sound area. As the audience witness a series of increasingly distasteful events, audio reference points are designed to evoke emotions of sadness, fear, anger, surprise and disgust in the listening-viewer; as well as embarrassment and guilt, and malaise and tension.

Wind, water (in the form of rain), birds and bugs (all within the Abstract sound area) are used extensively in the surround channels (containing Spatial sound area sounds) to illustrate the story's passage from initially sunlit,

untroubled times (signified by the sounds of summer birdsong and insects) towards the dark and sinister turn-of-events that track Grace's enslavement and her ritual abuse by the citizens she works for. This is illustrated particularly through the light, summer breeze that progressively becomes a chill, howling wind that accompanies the prominent Narrative sound area; and is noticeable over time in the surround channel, as the purposeful distraction from the earlier Temporal area score diminishes. And as if to set the tone of the mood, each chapter point - shown by a fade-up from black to a simple caption-card - is accompanied by an appropriate atmosphere that is present in the surround channels first, ahead of the scene we are about to see. (In this study's terms, the Abstract area sounds here are contributing to the Spatial sound area).

Both the monologue commentary and the actors' dialogue (both of which form a part of the Narrative sound area) are recorded in close-proximity, and few instances of realistic audio perspective are used on speech; instead, a sense of distance and isolation is conveyed by the, at first, ambiguous Abstract sound leitmotif of distant pile-driving, which as it becomes more apparent in the mix, and metronomic in its presentation, crosses-over to become part of the Temporal sound area. It is some considerable way into the film, well after the sound has registered with the listening-viewer, that we are told that it is the sound arising from the construction of a new State Penitentiary some miles away. This sound therefore serves as a constant, and increasingly insistent, reminder to both the Dogville town-folk, and the audience, that justice is figuratively present, albeit at a distance.

Crucially, along with *Apocalypse Now*, *Dogville* demonstrates that it is not only the *nature* of the sounds used in the Narrative, Abstract, Spatial and Temporal sound areas, but their *balance* within the mix (i.e. their relative levels) that determines the evocation of certain emotions within the listening-viewer.

Operationally, the mixing of the sound track for *Winter Light* is noticeably less subtle in comparison to a generation-later *Apocalypse Now* or the two generations-on of *Dogville*; and this is hardly surprising: tastes and styles change, improvements in equipment have granted a greater expressive

freedom; and as an art-form, cinema has always been subject to, and benefitted from, progressive empirical change.

But all three of these films confront our sensibilities as an audience - they demand and expect our full attention; and all three have conspicuously utilised sound as a vehicle for not only presenting their own verisimilitude, but to also engage and involve the audience through their emotions.

5.8 Conclusions

This chapter described the sound areas framework in more detail and used it as a tool to analyse the emotional presentation. Chapter 6 describes how the Four Sound Areas framework has been used in the three practice pieces presented in the portfolio for this PhD research.

6 Applying the Four Sound Areas

6.0 Introduction

This chapter describes how the Four Sound Areas framework was used by the author during the realisation of the works presented in the creative portfolio of this PhD: *The Craftsman*, *Here and Now* and Commonwealth Games Boxing.

6.1.1 Not every film Director is passionate about audio post-production

This research centres on a proposition that the emotional aspect to moving picture sound design is invaluable to the enhancement and articulation of a Director's vision. But not all Directors are necessarily as enthusiastic about the meticulous process by which their soundtracks are created as they are about shooting and editing their pictures.

Sidney Lumet directed 50 studio movies and received five Academy Award nominations[17] during his career as a Hollywood film Director, an impressive number by any measure; and his 1995 book 'Making Movies' is held as a reference work for those serious about film making. However, whilst Chapter One is entitled 'The Director: The Best Job in the World' and Chapter Five announces 'The Camera: Your Best Friend', Chapter Eleven disappointingly states 'The Mix: The Only Dull Part of Moviemaking'. It opens with:

> Life has a cruel way of balancing pleasure with pain. To make up for the joy of seeing Sophia Loren every morning, God punishes the Director with the mix. (Lumet 1995, p.186)

Lumet is not the only lauded Director to hold such negative views. The French *auteur* Jean Renoir was even more vociferous in his views on post-production sound:

[17] Sidney Lumet (b. 25/06/1924 – d. 09/04/2011) is described in *The Encyclopedia of Hollywood* as one of the most prolific filmmakers of the modern era, directing more than one movie a year on average since his directorial debut in 1957. (Siegel 2004, p.256) Interestingly, although he received five Academy Award ('Oscar') nominations over a career of 50 films, he never won an Oscar for his film craft or artistic work. He did however have an Academy Honorary Award bestowed on him in 2004 'in recognition of his brilliant services to screenwriters, performers and the art of the motion picture.'

> I regard dubbing, that is to say, the addition of sound after the picture has been shot, as an outrage. If we were living in the twelfth century, a period of lofty civilization, the practitioners of dubbing would be burnt in the market-place for heresy. Dubbing is equivalent to a belief in the duality of the soul.
> (Renoir 1974, p.106)

This unequivocal aversion towards the detailed preparation work of track laying and pre-mixing the soundtrack – the paying close attention to what is reasonable to consider as half of the final on-screen product – does however have one distinct advantage: unlike the picture editing department, who are often working under the close supervision of the Director from early-on in the post-production process, less early intervention by the Director means that the sound department is entrusted with a great deal of creative freedom as the film passes through the audio post-production stages, to be prepared for final mixing. In short, the sound department are left to get on with the job in hand, often up to the final mix; notwithstanding the creation of any interim, reel-by-reel, temporary mixes.

This kind of creative freedom is espoused by Rian Johnson, the Writer and Director of *Star Wars: The Last Jedi*, who said:

> Sometimes people think that a Director has a very specific vision and they're trying to get everyone on their crew to accomplish this. For me, it's always more of a collaborative journey of discovery. (American Cinematographer, February 2018, p.45)

With this journey in mind, it is hoped that the Four Sound Areas framework can become a widespread, common creative language; so that fellow professionals without an intimate understanding of the Sound Designer's or Re-recording Mixer's 'black art' - such as Picture Editors, Directors or Producers - will better understand, and therefore more effectively communicate, their overarching intention for sound design on their production.

The sections 6.1.2 – 6.3.3 detail studies of commercial sound design and mixing commissions carried out on two feature films and a Live-to-Air Outside Broadcast (O.B.) assignment at a major sporting event, which all utilised the Four Sound Areas as the basis for structuring their final mix. These three sound design works are reproduced in the accompanying professional portfolio of this research by creative practice and constitute the main output of this study; and by their different nature, attempt to show how the Four Sound Areas framework can be adapted to any type of moving picture project.

6.1.2 Study 1: *The Craftsman* (2012)

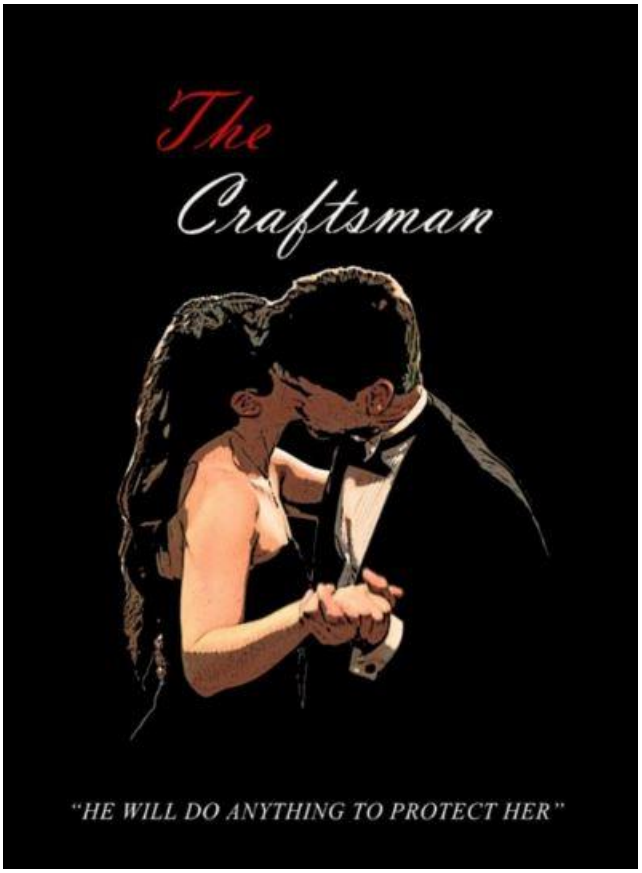


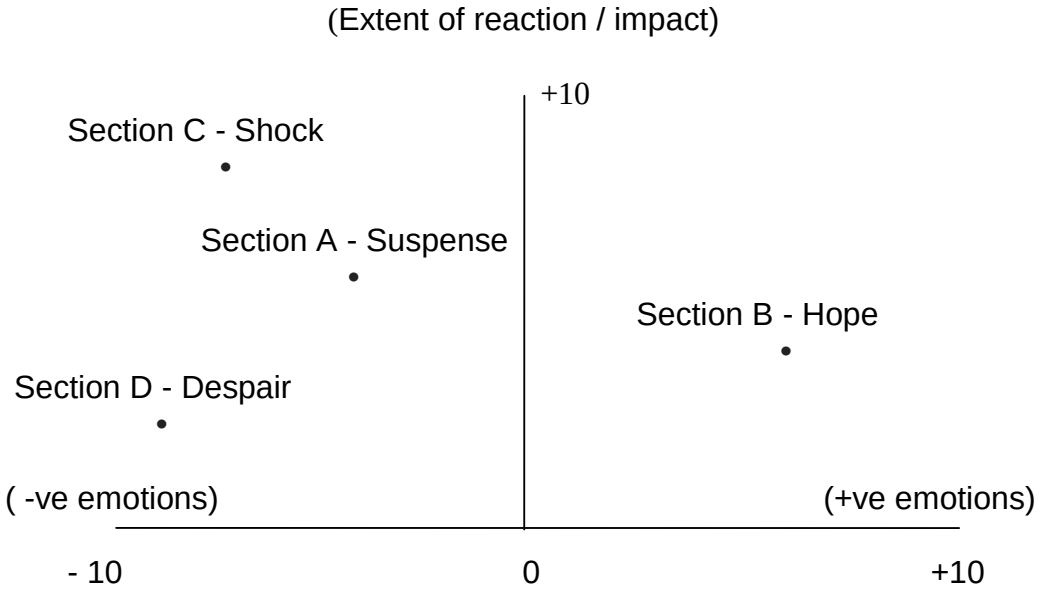
Figure 6 – The Craftsman (2012)

The Four Sound Areas framework was first formally used and appraised by the author as the Production Mixer, Sound Designer and Re-recording Mixer on the short film *The Craftsman*, which was produced by Sheringham Studios as a commercial release in 2012. The screenplay is taken from a collection of

Stuart Neville short stories, *Down These Green Streets* (Neville 2011). The author was engaged to look after both the production sound (location recording), as well as the sound design and audio post-production.

At the pre-production stage, the Director and the author began to discuss key emotional points in the script that would serve as markers for the soundtrack, (four sections, denoted as A, B, C and D), and a simple 'sound design quadrant' was produced by the author, to show the film's emotional high and low points; where ‘positive’ and ‘negative’ feelings would ideally be evoked in the audience through the medium of the sound mix.

The horizontal axis has a simple negative to positive ‘scale’ of emotions assigned to it and the vertical axis indicates to what extent ‘reaction’ or 'impact' is intended on the listening viewer, caused by the soundtrack. This is the author's own simplified version of the sound-mapping principle advocated by sound designer and academic David Sonnenschein. (Sonnenschein 2001, pp.18-32)



The simple Sound Design ‘quadrant’ used for *'The Craftsman'*.

Figure 7 - Intended emotional positioning of the Sound Design for Sections A, B, C and D. The simple Sound Design quadrant of Figure 7 draws on Russell’s circumplex model of affect, albeit a ‘semi-circumplex’ version is used in this work. Vertical axis represents Valence. (Russell, 1980)

6.1.3 Emotional Sound Design and Mixing considerations by section

Section A - The Hit; Albert and Celia meet and dance for the first time

Sound Design and Mixing intent: The film opens with low-level score mixed with the sound of slow-moving tyres on gravel, as a car approaches the gates of a grand house, in a convoy with others. It pulls up at the request of the gate security guard and the driver presents his invitation. Their conversation is intentionally low in the mix, audible but unintelligible (therefore of the Abstract sound area), and the vehicle passes scrutiny. The car moves off and pulls up on the gravel drive in front of the house, and the driver steps out. We see Albert, the driver, for the first time. He takes out a guitar case and joins other alighting musicians from the convoy of cars, all carrying instrument cases.

Albert enters the building and we start to hear the murmour of a distant yet sizeable crowd, again held low in the mix (from the Abstract sound area). The music changes tempo, quickening the pace (Temporal sound area) as Albert follows the group at a discrete distance, choosing to divert unnoticed from the party through a side door, once he is inside the building. The pace of the score again slows as we see and hear a creaky exterior door being opened, and Albert steps onto a blustery roof, the wind effects brought forward in the mix. With precise, deft movements the guitar case is clicked open and a sniper's rifle and sight mechanism is quickly assembled. Extra Foley sounds were added in post-production as punctuation and to also highlight the mechanical precision of the process, from the guitar case clips to the assembly of the weapon. Once more the music builds in tempo and level, as does the wind, the two balanced against each other and Albert's controlled breathing is now also clearly audible. All three sets of sounds - the music, the rifle assembly effects and Albert’s breathing - are contributing to the Temporal area. Following Albert's ironic “Goodnight” (replaced in ADR for performance: giving greater emphasis in performance) the music reaches its climax; and a combined silenced gunshot and glass-smash pre-empt by a fraction the tinkle of a shell case hitting the floor (the Narrative sound area elements here are the line 'Goodnight', as well as the gunshot and shell case) the surge in wind segues the picture mix through the Title caption and into the crowd murmour and bar

piano of the cocktail party, that Albert now joins.

The gentle level and nature of this ambient, diegetic music and the general feel of bonhomie suggested by the moderate party murmour is in stark contrast to the overall level and intensity of the scene we have just left. Here the biggest contrast between the previous and present scenes is from the Temporal sound area – the urgent pace has relented and the tension carefully built-up in the opening of the movie has been released by the gunshot.

We see Albert order whisky and coolly light a cigarette, and Celia enters, joining him at the bar. For intelligibility, the background crowd murmour is subliminally lowered in the mix and becomes more present on the rear speakers, as the front speakers alone deliver the dialogue between Albert and Celia. She asks him to dance and the diegetic bar piano is carefully replaced by the non-diegetic score, still played on solo piano. As a Steadicam shot slowly revolves around them dancing, the crowd murmour is faded completely away leaving just the leitmotif figure on the piano controlling the tempo of the pictures and the pair's sonically unchallenged dialogue. A photographer appears in the wider shot ready to take a portrait of the happy couple, and the background crowd atmosphere fades back in as he asks them to smile for his shot. At this point, coinciding with the authoritative 'pop' of the period camera's flash bulb, the sound of a gunshot (this time working in the Abstract sound area) is combined; serving as a full stop on that time period, and as a subliminal reminder to the audience of the brutal nature of Albert's work, given the intense romanticism and tenderness we have just seen between the couple.

Mixing notes: There is a noticeable Temporal change from the fast-paced opening scene (the hit) to the slow romanticism of their dance, which ends the scene.

Intended Emotions: Suspense and tension: Intensity is carefully built and sustained, then released by the gunshot.

The descriptors of *Intended Emotions* here and in the rest of the chapter are taken from *A prototype analysis of emotion words* (Shaver et al, 1987 reproduced in Juslin and Sloboda, 2010, p.80)

[DVD 00:00:07 to 00:05:30]

Section B – Albert proposes to Celia

Sound Design and mixing intent: This scene is designed to establish a flourishing, romantic relationship between the couple; and within the dialogue (part of the Narrative sound area) we see the cautious opening-up of Albert's emotions. He appears to be emotionally vulnerable as he strives to find the right words to express his love for Celia, and he is still guarded about the true nature of his occupation. But his hint to her of his 'cleaning' work suggests that it is only a matter of time before he trusts Celia enough to satisfy her curiosity, made obvious by her determined and repeated probing questions. Once she knows the truth, everything must change; but for now, in her state of blissful ignorance, there is still an air of innocence for her and a sense of renewal for him, following the years he has had to spend shrouded in secrecy. The prominence in the mix of birdsong (from the Abstract sound area) is an obvious presence, designed to suggest to the listening-viewer Celia's innocence and to share her feelings that all is well; whilst the presence of the sound of running water from a stream (also drawn from the Abstract sound area) is designed to allude to the figurative cleansing Albert feels in declaring his love for Celia. The scene culminates in his proposal of marriage, and her happy acceptance.

Mixing notes: the prominence in the mix of the Abstract sound area is designed to suggest a period of safety following the dangers of previous scenes; a carefree innocence and renewal.

Intended Emotions: Affection, happiness, peacefulness, tenderness, hopefulness.

[DVD 00:08:07 to 00:09:58]

Section C – The Doctor is killed by Albert, for hearing Celia's secrets

Sound Design and mixing intent: With Celia terminally ill, we see that Albert is still very much in love with his bedridden wife, being visibly kindly and gentle towards her as they talk; but old age has certainly not diminished his uncompromising resolve to retain at all costs the utmost secrecy about his past as a professional killer. The background atmosphere - mixed low against the dialogue as he dresses in their bedroom - is that of an urban summer's

afternoon, drifting in through an open window: a lawnmower runs in the distance, occasionally a low-speed car drives past and the songbirds, albeit now at low-level, remain present. These are all sounds from the Abstract sound area. Albert lightly says that he is going in to town, but when pressed by Celia, he reveals that his visit is concerned with his dark distrust of the situation with the Doctor who tends to Celia; and the fact that the Doctor has heard her rambling recollections. Celia, along with the audience, is left in no doubt that Albert is going to assassinate the Doctor for what he has accidentally overheard of Albert and Celia's years as a hit-man and wife. This revealing of the true purpose for Albert's trip coincides with the absence of birdsong (from the Abstract sound area) from the mix and the introduction of a sudden, musical crescendo (from the Temporal sound area).

Later, the Abstract sound area atmosphere tracks that cover the wide shots of Albert in the park, awaiting the Doctor, are made prominent in the mix to instil a feeling of restlessness in the audience; presented as the sound of persistent wind and rustling leaves. There are no songbirds to be heard. The coldness in Albert's heart towards the man who has been so compassionate to Celia is mirrored by the chill wind present in the front and surround channels (a utilisation of the wind in the Spatial sound area). As the Doctor joins Albert, and Albert's monologue takes on a more sinister tone, the score is re-introduced in the mix with a very long, slow fade, overshadowed for much of the scene by the persistent wind in the trees. This wind is also increased in level and becomes more intense as Albert's speech progresses; the rustling of the leaves becomes noticeably sibilant, like a heavy sea wash arriving in waves on a windswept shore. The mix at this point is attempting to reflect the tumult within Albert; and through the high level of Abstract sounds, it aims to convey outwardly the turbulence and agitation he is inwardly feeling. As Albert becomes irritated by the subject of his discourse, so too the weather-borne sound effects are intentionally pushed in the mix, challenging the primacy of Albert's lines and to act as a source of irritation and unrest to the listening-viewer. This is the most crucial point of *The Craftsman's* soundtrack. Here in the film, all Four Sound Areas are continually being balanced against each other, as their relative loudness levels exchange aural priority. The mixing of the soundtrack is

designed to create dense effects, yet without completely overshadowing the intelligibility of what is being said. Towards the end of the scene, where the music is increasing in level (Temporal sound area), the exterior atmosphere (Abstract sound area) challenges the dialogue and extra Narrative sound area effects are sequentially added to the mix: a gunshot, the cries of startled birds, the flapping of their wings segueing into Albert's fleeing footsteps, and then in turn they too are swallowed by the engulfing wind and leaves, which themselves mix and resolve into the sound of running water in the sink of Celia's bathroom. The flowing water introduces the change of scene, and moves the storyline back to Celia and Albert's bedroom.

Mixing notes: the complex balancing and interchanging priority of all Four Sound Areas and the building of tension by gradually increasing the overall volume of the Abstract, Temporal and Spatial areas to meet that of the constant level of the Narrative area.

Intended Emotions: Darkness, melancholy, anger, contempt, disgust, surprise.

The sound design intended a similar Arousal level of emotions to be evoked in Sections A and C, albeit either side of the emotional Valence axis; Albert, whether for justifiable reasons or not, is seen taking a human life. It is intended to deliver an effect that is both tense and shocking at its culmination. (See Figure 7). **[DVD 00:10:02 to 00:14:28]**

Section D – Celia demands a promise be fulfilled by Albert

Sound Design and mixing intent: In the last section of the film, the fast tempo of Albert fleeing the scene of the crime returns first to a moderate pace, and then finally to a slow tempo, as Celia herself moves slowly and painfully to bring their affairs to a conclusion. Here, just like Celia’s gaunt figure, the soundtrack becomes intentionally meagre: stripped back and bare towards any of the sound areas other than the Narrative, which carries Celia and Albert’s sonically-unchallenged dialogue. From a mix point of view, this is the opposite of Section B’s richness, where the Abstract sound area is emphasised to fill-out the soundtrack (and the surround channels). Here, Celia knows that life itself is ebbing from her, and asks that that process is completed swiftly - and in her

terms compassionately - by the expert she knows Albert to be. This request from Celia of Albert, the very prospect of carrying out that act, also appears to bring a halt to Albert's own life; if only at this stage at an emotional level. But Albert's last lines, and his delivery of the dialogue, may be interpreted that he will take his own life if he is obliged to take Celia's. With the sound areas other than the Narrative dialogue sat very much in the back in the mix, the ambience is firstly an understated interior atmosphere with an occasional, almost subliminal passing car, and a score that sits deliberately low, peeping through for the most part only in the gaps of dialogue. To achieve this, the level of the music is carefully ridden in the mix throughout the scene. As the film draws to a conclusion and the couple move outside to dance one last time, the interior atmosphere is matched by an exterior counterpart; with occasional passing cars now being the actuality of the recorded production sound. The score's leitmotif returns to the final shots of the film with a long decay of the final note allowing a punctuating ‘full stop’ of silence before the credit music rolls.

Mixing notes: Temporal change and narrower mix to focus and reflect the demise of Celia, and in turn, Albert.

Intended Emotions: Sadness, sentimentality, regret, sympathy, grief, sorrow, despair.

The sound design in Sections B and D are designed to evoke diametrically opposed emotions in terms of Valence, whilst of a similar level of Arousal; the first of the two scenes is based around hope, the second is grounded in despair. (See Figure 7). **[DVD 00:14:30 to 00:26:19]**

6.1.4 An initial attempt at visualising the mix-balance of the Four Sound Areas for *The Craftsman.*

The aim of this part of the study was to roughly quantify and visualise the variations of mix-balance of the Four Sound Areas throughout the film, and to look at whether specific emotions would correspond to specific mix-balances of the Four Sound Areas.

In this initial study it was not possible to easily derive the loudness of the Four Sound Areas directly from the mix, because even though the soundtrack was designed in terms of the Four Sound Areas, *The Craftsman* was mixed at a time before the widespread use of plug-ins, using a traditional mix-bus structure (e.g. dialogue, sound effects, music, and atmos).

The use of a plug-in LUFS meter (now readily available for all types of DAWs), or even an RMS meter, could have easily provided rather more tangible level figures for comparison purposes. However, at the time that the film was created, the Fairlight Prodigy II DAW did not support plug-ins; and the subsequent lack of access to the original audio assets has made this impossible to achieve retrospectively, on a newer DAW.

Instead, the levels were subjectively quantified by the author (the Sound Designer / Re-recording Mixer of the film) on the basis of the mix notes made at the time and the knowledge of having mixed the film. A nominal scale between 0 and 6 was used, as shown in *Figures 8a* and *8b*, after having divided the soundtrack into relatively homogenous sections. This simple scale has ‘3’ as being half of the perceptual loudness of ‘6’.

The subjective levels of the Narrative, Abstract, Temporal and Spatial sound areas were produced at five points during the long, opening scene A, one set of levels were produced for the shorter, falling in love of scene B, and at two points each for scenes C and D.

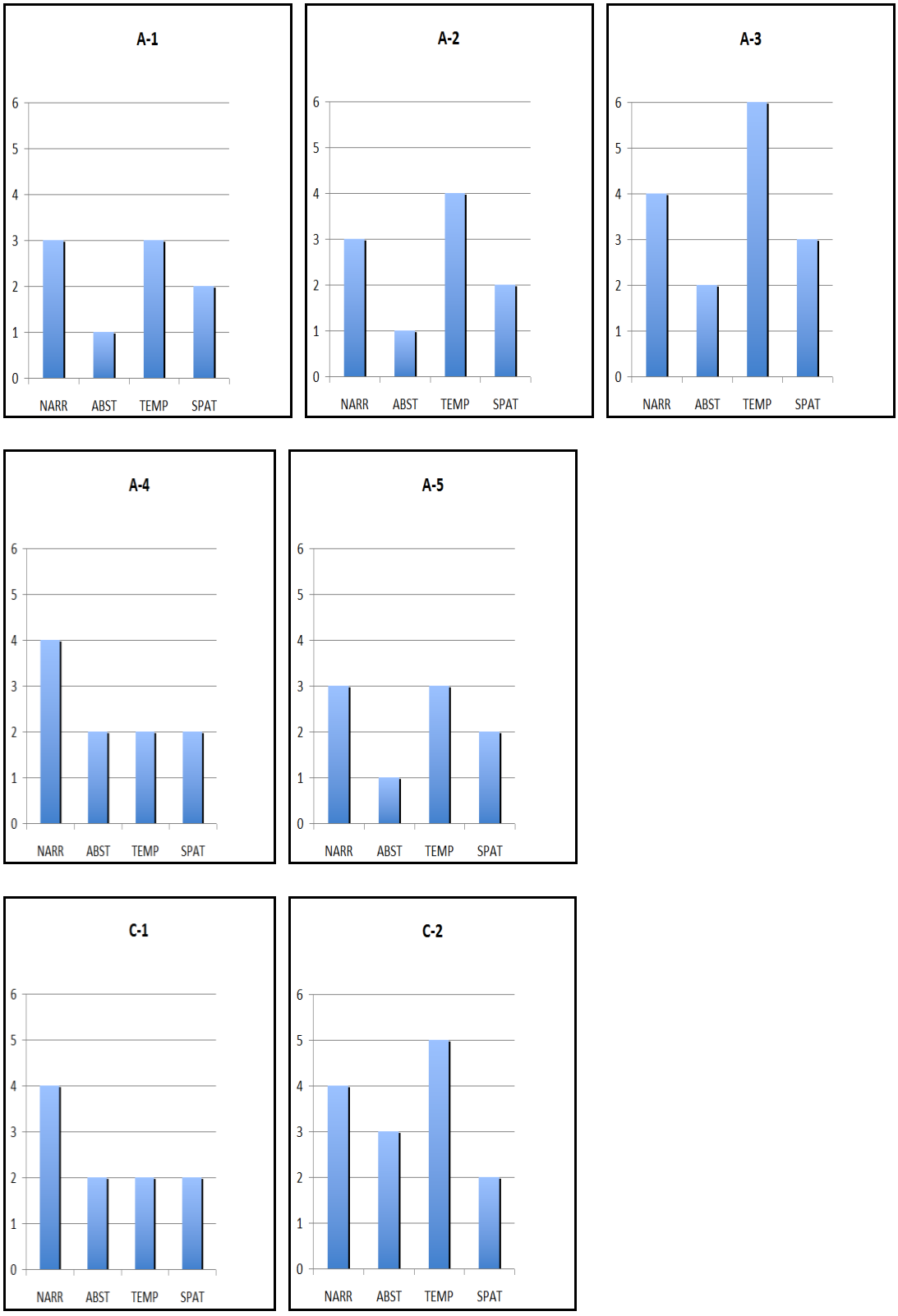


Figure 8a – The Four Sound Areas observed through film Sections A1-5; B-1 and C1-2.

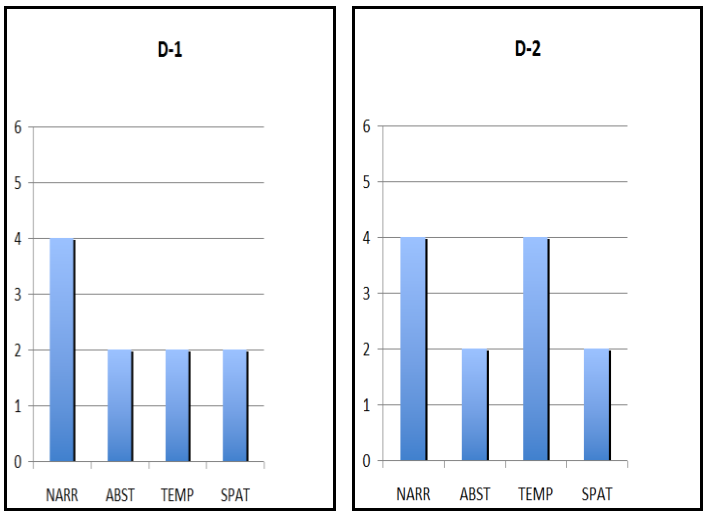


Figure 8b – The Four Sound Areas observed through film Sections D1-2.

6.1.5 Observing the Four Sound Areas at work in *The Craftsman*

The graph in *Figure 9* gives an overall view of the average level of sound area data on the vertical axis, for the intended emotion in each of the Four Sound Areas, across the chosen Sections A – D of the film *'The Craftsman'.*

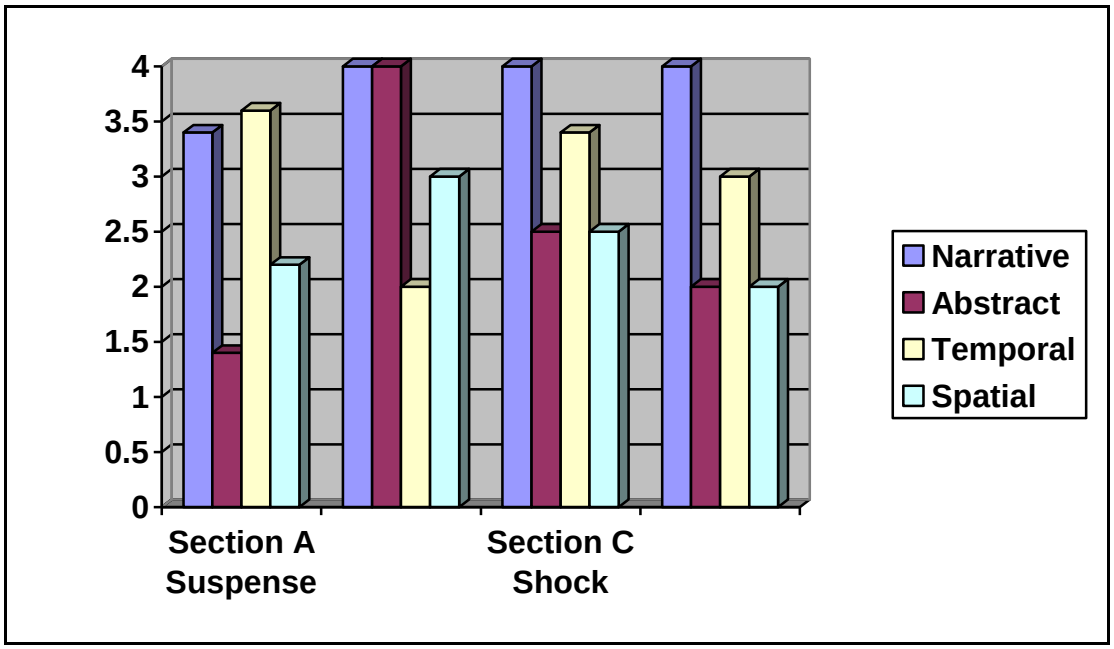


Figure 9 – Average level by Sound Area for Sections A-D, where Section A's intended emotion = Suspense, B = Hope, C = Shock and D = Despair.

The analysis of the mixing approach suggests that designing the soundtrack for negative emotions - in this case 'Suspense' (Section A), 'Shock' (Section C) and 'Despair' (Section D) - gives a similar pattern of sound area presence (a high Narrative and Temporal sound area score, but a low Abstract and Spatial one in the mix); whilst the higher the degree of audience impact / reaction that was intended, the higher in perceived mixing level the sound areas that contribute to these negative patterns seem to move.

However, the positive emotion - in this case 'Hope' (Section B) - seems to have a different mix pattern (high Narrative, Abstract and Spatial sound area scores, but low for Temporal). Specifically, it was the Temporal and Abstract areas that showed most change for this intended emotional effect.

6.2.1 Study 2: *Here and Now* (2014)

Figure 10 – Here and Now (2014)

Here and Now is a low-budget British feature film, written and directed by Lisle Turner and made by Wrapt Films, in association with Creative England.

Sound design and full audio post-production was undertaken by the author between January and October 2013, at The Audio Suite in Moseley, Birmingham, assisted by Dan Rhodes. The final theatrical mix and associated stem deliverables were created at the AIR Lyndhurst studios in Hampstead, London by the author and fellow Re-recording Mixer and long-standing colleague, Pip Norton.

The first public showing of the film was at the BUFF film festival on March 11th and 12th 2014, in Malmö, a municipality in Skåne County, Sweden.

6.2.2 On Sound Designing and Mixing *Here and Now*

Here and Now was shot in late summer 2012, and shortly before shooting began the author was engaged by the Producer, Martina Klich, to oversee audio post-production, acting as the film's Sound Designer, Supervising Sound Editor and Re-recording mixer.

In pre-Production conversation, Director Lisle Turner discussed his aspirations for the locations he was filming in, and how he wanted distinct differences in the soundtrack for eight specific scenes. The author's initial thoughts were that this difference could be best achieved in audio post-production; feeling that the main consideration on location should be for the dialogue to be recorded and presented in an effortlessly intelligible state, in its natural aural environment. However, and disappointingly, the dialogue recorded on location was of too poor a quality to be used in the final film soundtrack, requiring the replacement of all of the dialogue by Automatic Dialogue Replacement (ADR), for all the film's main characters, plus the speaking extras.

6.2.3 Initial sound design ideas

From reading and discussing the script with the Director, his desire to have eight distinct soundscapes associated with specific locations and scenes in the film became apparent; and a day spent together in the author's studio carrying out a spotting session, watching the first cut and listening to the Director's thoughts and comments regarding the plot and storyline, brought

about a better understanding of what the significance was of any particular shot, scene, location or line of dialogue.

What was determined during the spotting session was that *Here and Now* is not simply that of a boy-meets-girl love story; it is a film that was written to incorporate the Buddhist principle of the 'noble eight-fold path'. Eight distinct scenes are used to illustrate each of the eight Buddhist elements, namely: *right view, right intentions, right speech, right action, right livelihood, right effort, right concentration* and *right mindfulness*; and eight particular scenes within the film would each constitute a noticeable occurrence where one or both of the key characters, Grace and Say, achieve a step forward on their path towards self-discovery, and reach an unconscious understanding of one of the noble eight-fold path principles.

A perceptive audience should be able to notice this progression in the two main characters over time but to help signal this, one Sound Design suggestion put forward by the author and incorporated in the final soundtrack was that a Buddhist bell (actually a 'singing bowl') should softly ring at the precise moment of each of the eight occurrences of insight; an *homage* by the author towards Re-recording Mixer Clem Portman's 'angel's wings' bell used in Frank Capra's 1946 movie, *It's a Wonderful Life*. The singing bowl was used instead of a bell to more obviously carry the Buddhist analogy and also to not too closely imitate Capra's original soundtrack.

Other sound design considerations the author suggested at the spotting session included:

- The need to establish distant farm working and a sleepily dormant agricultural feel. There is just one shot - very distant - showing a tractor working in a field late in the film that allows the use of a closer, but still distant, tractor to immediately place Grace in the countryside e.g. her waking up in the first scene following the titles sequence. There are also several reflective, static shots of disused farm machinery. (It was anticipated that much of this would be covered by sounds from the Abstract sound area).

- The use of contrasting bird sounds (e.g. Crows versus songbirds) to help create an atmosphere of risk and danger as opposed to the rural idyll suggested by the songbirds. Differing locations being e.g. the stark, ruined castle and the pretty flower garden of Grace's rental cottage. (Sounds such as the Crows would be drawn predominantly from the Narrative sound area when they would be signalling a change in mood, but also placed in the Abstract sound area).

- Suggest the lateness of summer and the ripening of fruit in the orchard scene by adding the presence of bees and fruit flies. This scene marks a turning point in Say and Grace's relationship, as well as the turning of the seasons from summer to autumn; and the resulting sound is designed to evoke the combination of warm days and rotting, fallen fruit. (The sounds of the insects would be contained within the Abstract sound area).

- The sound of exterior wind chimes softly present on the interior atmospheres of Poppy's 'hippy' barn conversion. (In the Abstract sound area, but also used for their Temporal qualities in The Castle scene).

- Different strengths and types of wind to induce a sense of calm, restlessness or dramatic impact. (Abstract sound area).

- The sound of running water in the swimming and post-swimming scene to engender a sense of cleansing and renewal as the closeness between Say and Grace grows. (Abstract sound area)

- Utilise the surround channels to enhance a sense of presence, immersion and perspective for the listening-viewer, particularly in the shots of Say and Grace walking through the cornfield. (Spatial sound area).

6.2.4 Replacing the dialogue

By far the most painstaking part of the audio post-production process turned out to be the complete re-recording of the dialogue. All of the lines

required replacing because of the poor quality of the original location recording – primarily because of inexpertly fitted radio microphones being utilised almost exclusively, instead of a well-placed boom microphone; resulting in the actors' body movements and clothing rustles fatally colouring the on-set recordings, rendering them useless for anything other than an ADR guide track. This process, however, also allowed, at times, the improvement of delivery and emotional performance which impacted positively on the sound design of the film.

Figure 11 – Lauren Johns (Grace) recording her ADR lines at The Audio Suite

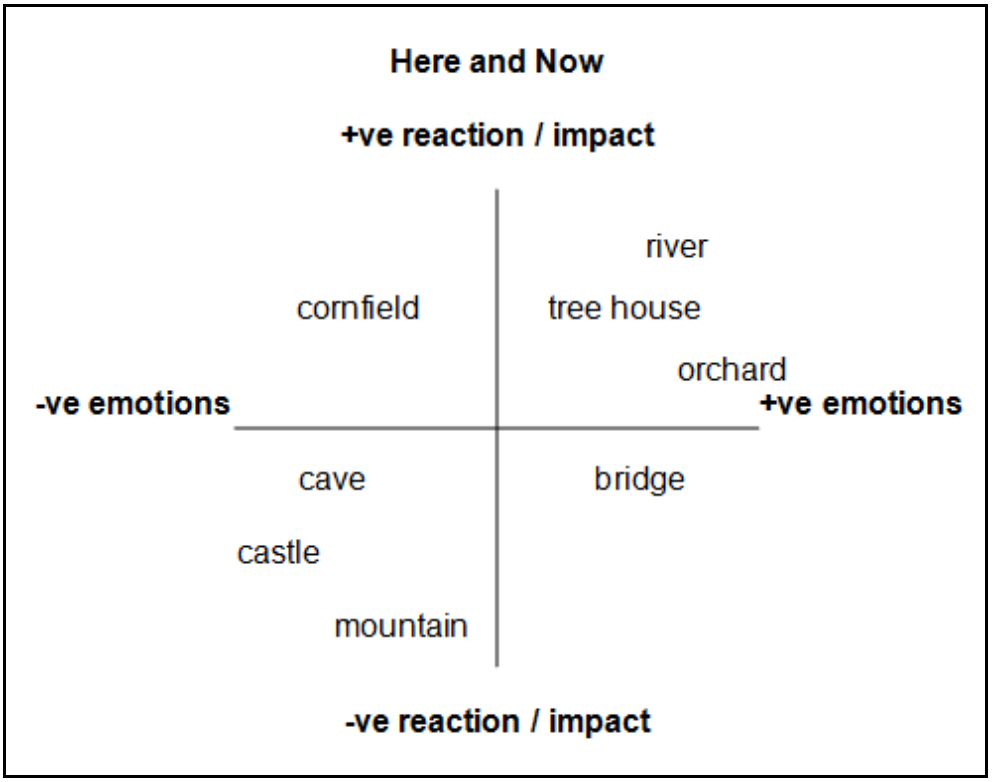


Figure 12 – Sound compass used for initial discussion with Director Lisle Turner

6.2.5 The application of the sound design and emotions categories

After reading the script for *Here and Now*, a development of the simple sound design compass (seen in *Figure 7*) became the two-axis 'sound compass' (shown in *Figure 12*). This was drawn to highlight where on the 'emotional spectrum' the key scenes would ideally sit. The horizontal emotions **(e)** axis runs from 'Negative emotions', like disappointment or sadness, towards 'Positive emotions', like optimism and happiness. The vertical axis shows the intended reaction / impact **(ri)** in the audience; and this represents the intended extent of the emotion attempting to be induced in the listening-viewer; in either a positive or negative context.

Whilst the Director took a keen interest in the music for the film, the author was equally keen to demonstrate that it was possible in the gaps between the dialogue and music for the mix to effectively convey a sense of 'being'; the Abstract sounds between the Narrative words setting the mood,

place and space. From a sound design and mixing point of view, it felt important to immerse the listening-viewer and engage them through atmospheres that not only connected back to the landscape, but also brought it to life.

Scene	**Narrative Principle**	**Positioning**	**Intended Emotions**
1 – Castle	Right Understanding	(-e), (-ri)	Sadness, Fear
2 – Cornfield	Right Thought	(-e), (+ri)	Irritation, Contempt
3 – Cave	Right Speech	(-e), (-ri)	Sadness, Despair
4 – Orchard	Right Livelihood	(+e), (+ri)	Happiness, Joy
5 – River	Right Action	(+e), (+ri)	Enjoyment, Pleasure
6 – Bridge	Right Effort	(+e), (-ri)	Tenderness, Surprise
7 – Tree house	Right Concentration	(+e), (+ri)	Involvement, Interest
8 – Mountain	Right Mindfulness	(-e), (-ri)	Guilt, Worry, Fear

Table 1 – Sound design intended Buddhist principle, positioning and emotions

The chronological order, the Buddhist principle and the positioning on the sound compass that the eight significant scenes appeared in the film is shown in Table 1.

6.2.6 Plot, sound design and mixing notes

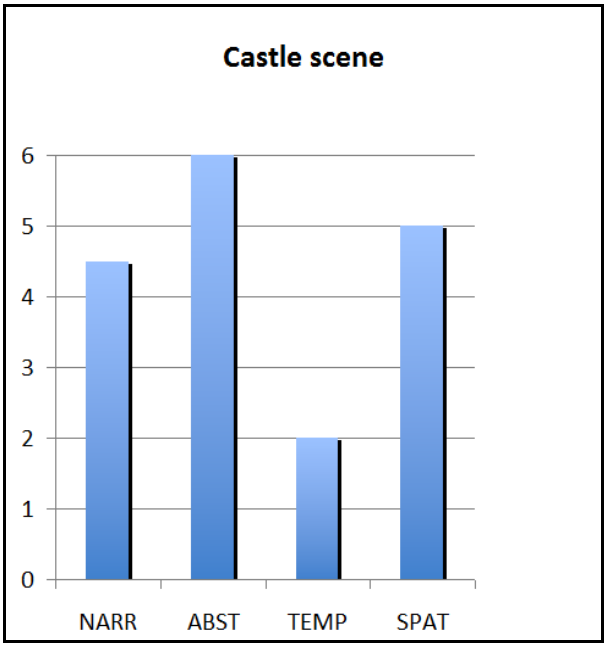
[Times refer to DVD 3 - ‘Here & Now 5.1 Temp-mix’.]

In an attempt to evoke emotions that would support the storyline and plot, each of the film’s eight significant scenes were designed at the tracklay stage to work in a way that would go on to support the final mixing stage with an intended audio emphasis; and both the tracklay and mixing process related directly to the Four Sound Areas of this research. The intended emphasis is

shown in *Figures 13.x*, with the relative levels noted by the author whilst mixing the final soundtrack.[18]

1 – Castle: **[00:13:42 to 00:16:57]** (Compass –e / -ri)

Say takes Grace to a stark, ruined castle; and uncaringly she says that the village is the kind of place that if she had to permanently live there, she'd jump off the castle tower. She then discovers that Say has a suicidal tendency, when he climbs up the tower and appears to make a decision whether to jump or not. Grace, and we the audience, are shocked by this brush with death - a 'negative' emotion, inducing a 'negative' reaction to what we have just witnessed. Grace, still cold towards Say, now has the *right understanding* about him having unspoken issues.



Narrative – dialogue

Abstract – birds, wind

Temporal – score

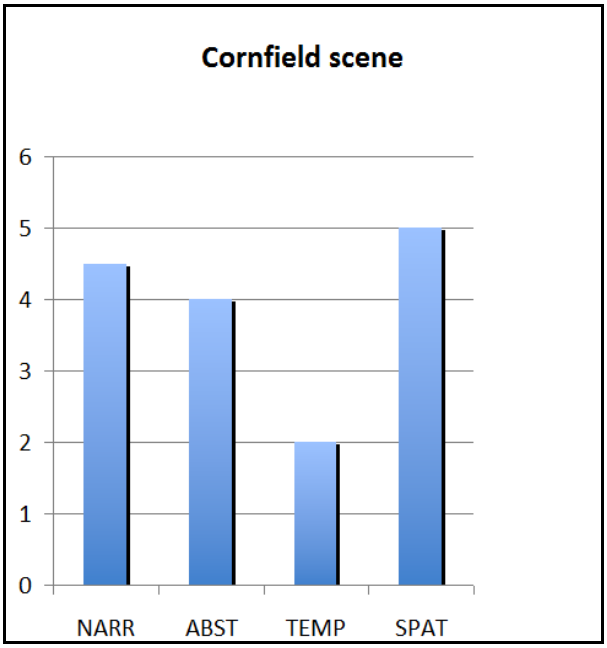
Spatial – wind in surround channels, reverb on dialogue.

Figure 13a – Castle scene, audio mix emphasis

[18] The author routinely uses a Peak Programme Meter (PPM) as a reference tool when mixing and this was also used as the form for a simple scaled guide when noting the average levels of the four sound areas, across the individual scenes, as mixing took place.

2- Cornfield: **[00:20:21 to 00:25:29]** (Compass position –e / +ri)

Say takes Grace into the middle of a tall cornfield, to sit in perfect peace in a bizarrely beached rowing boat. Grace however is bored and desperate for a usable mobile telephone signal. Wandering away into the corn, she gets lost and becomes frightened, calling out for Say. He finds her and she feels rescued; looking at him with the first hint of warmth and connection. Her negativity of the place and her perceived situation is countered by the positivity of her being grateful and seeing him in a different light. She has had a *right thought* about him.



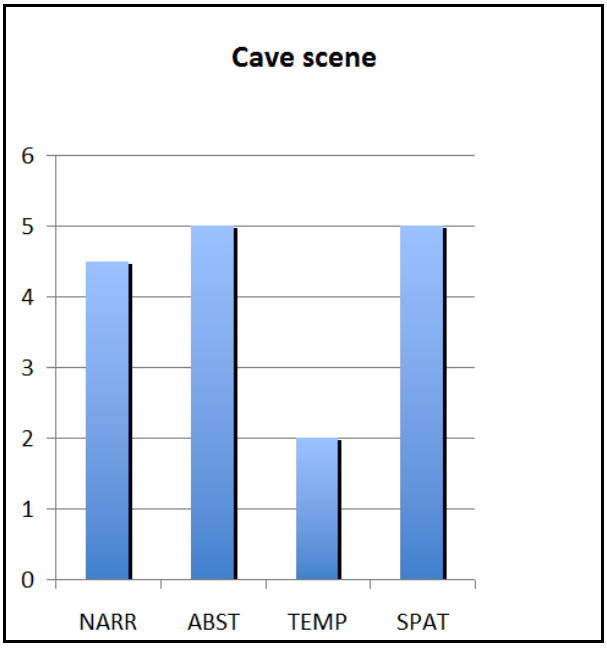
Narrative – dialogue, cuckoo, mobile phone message alert, corn stalks
Abstract – birds, bugs, wind
Temporal – score
Spatial – surround panning walking through cornfield.

Figure 13b – Cornfield scene, audio mix emphasis

3 – Cave: **[00:31:24 to 00:36:21]** (Compass –e / -ri)

Say takes Grace out of her comfort zone when he gets her to climb down into one of his special places - an underground cavern. She has to place her trust in him. In the torchlight he plays ‘Amazing Grace’ on his harmonica for her

and the tenderness of the gesture is not lost on her. She reciprocates that tenderness and for the first time she says a kindly word towards him. She is demonstrating *right speech*. However, the situation quickly flips and we are left with a negative feeling about their relationship towards each other, with the disappointment that it should turn out like this again.



Narrative – dialogue, harmonica

Abstract – room tone

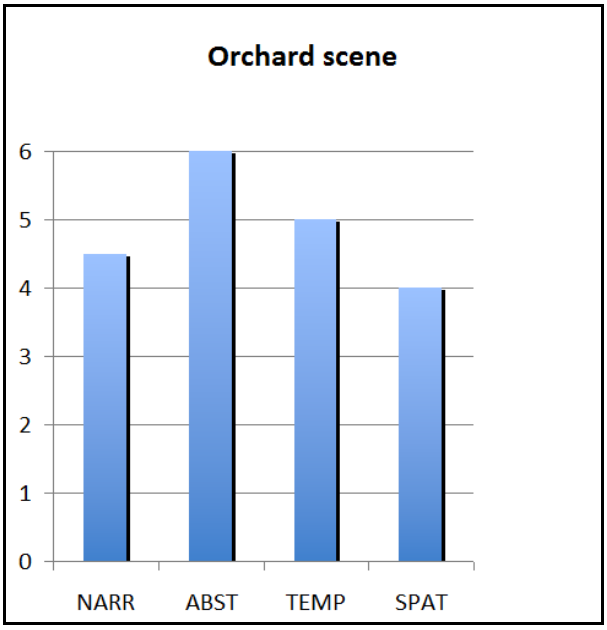
Temporal – score

Spatial – room tone, emphasised reverb on dialogue and harmonica.

Figure 13c – Cave scene, audio mix emphasis

4 – Orchard: **[00:38:55 to 00:43:48]** (Compass +e / +ri)

Awoken at dawn by Say, Grace joins in with the work of harvesting apples from a nearby farm's orchard. At first she wilfully refuses to relate to, and interacts clumsily with, the other farm workers; but she comes to appreciate the serenity of a more simple country existence, living closer to nature and in harmony with the seasons. She appreciates the honest work and gains an awareness of what a *right livelihood* may consist of. There is a hopeful positivity for the viewer in this development.



Narrative – dialogue, fiddle, harvesting stick sounds, distant tractor

Abstract – birds and bugs, livestock

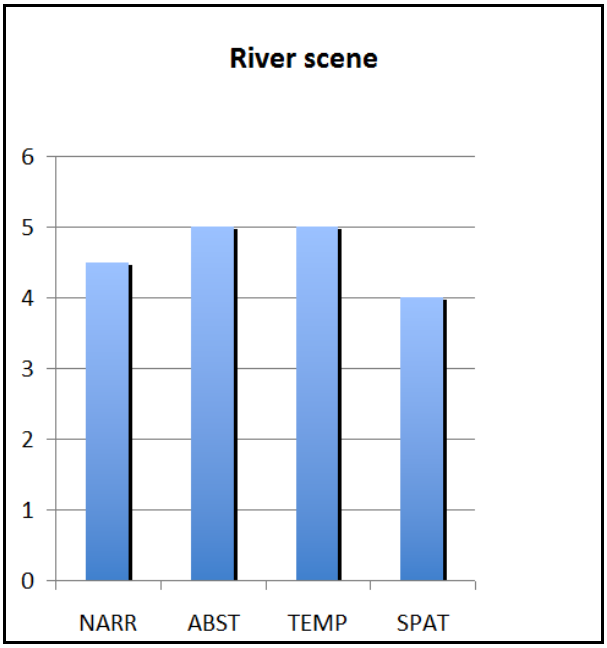
Temporal – score

Spatial – livestock

Figure 13d – Orchard scene, audio mix emphasis

5 – River: **[00:47:51 to 00:51:25]** (Compass +e / +ri)

After a disastrous day out with her parents, Grace takes comfort in the company of Say, who surprises her with undressing by the river and inviting her to swim with him. The act of swimming together, and them actually having fun, lightens her mood and brings about a feeling of intimacy towards Say. She learns how by undertaking the *right action*, she can experience new and nourishing feelings. This is the most positive and optimistic point of the film. A real change has taken place in their relationship; they are comfortable together.



Narrative – dialogue, swans swimming close by

Abstract – wind, trees, birds

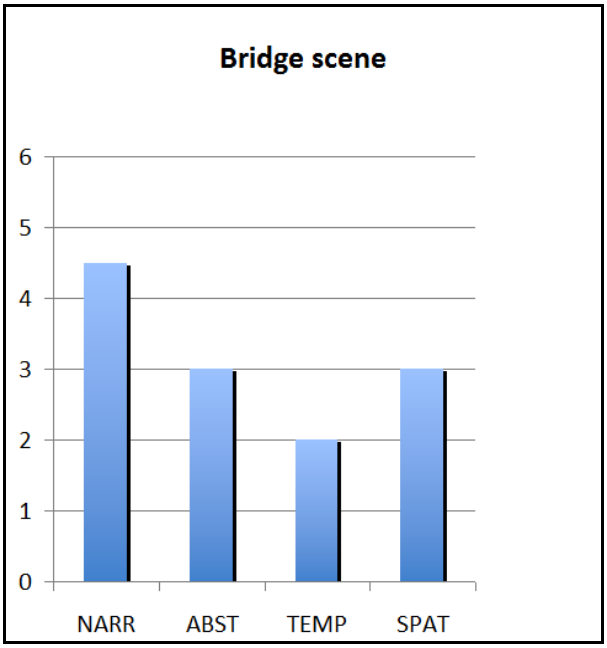
Temporal –flowing river, water splashes, score

Spatial – wind, trees, birds

Figure 13e – River scene, audio mix emphasis

6 – Bridge: **[00:52:44 to 00:54:32]** (Compass +e / -ri)

Say has on-going difficulties with the village bully, Tony, and his two henchmen. Through avoiding them, and then observing their loutish behaviour from the height of the overhead bridge, Grace counsels Say to stand up to them. To show her support for Say, and her despising of the thugs, she drinks deeply from a water bottle and then spits down onto Tony's head. As strange as this act is, it is the first time that Grace has done anything for anyone other than herself; and therefore the intention can be seen as *right effort* on Grace's part. In emotional terms, it is positive to see Grace acting for someone else; but there is still something vaguely dysfunctional about the situation, and this atmosphere is left hanging in the air.



Narrative – dialogue, spitting

Abstract – leather coat creaks, wind through bridge superstructure, trees

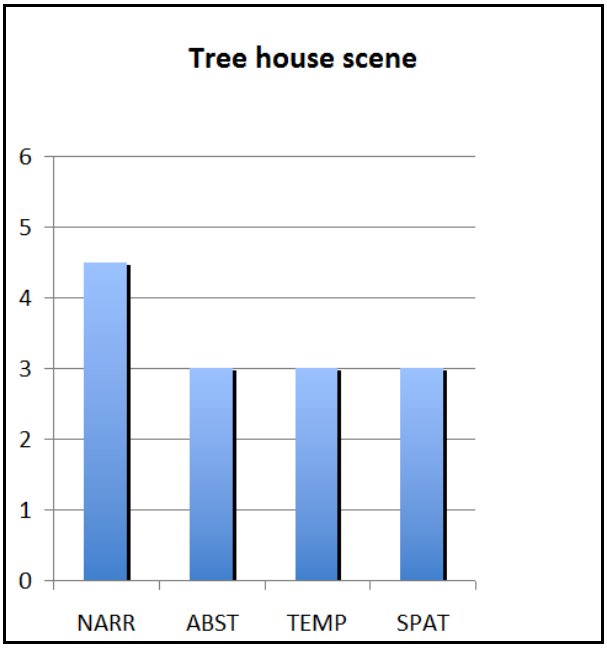
Temporal – flowing river

Spatial – trees, wind, birds

Figure 13f – Bridge scene, audio mix emphasis

7 – Tree house: **[01:06:20 to 01:09:27]** (Compass +e / +ri)

Poppy's party has been successful insofar as Ben and Lucy are now closer again, and Grace and Say are both comfortable in expressing their intimacy with each other. In Say's tree house, wrapped in each other's arms and in a blanket to ward off the cool of night, Grace wants to know about Say's future. But all too soon, Grace is called for by her father, as her parents are leaving for home. Grace has shown *right concentration* in considering, asking and listening to Say and thinking about someone other than herself. Witnessing this development is intended to be a significantly positive and hopeful experience for the listening-viewer.



Narrative – dialogue

Abstract – fire crackling, tree creaks, wind, owl, fox

Temporal – tree creaks, wind, score

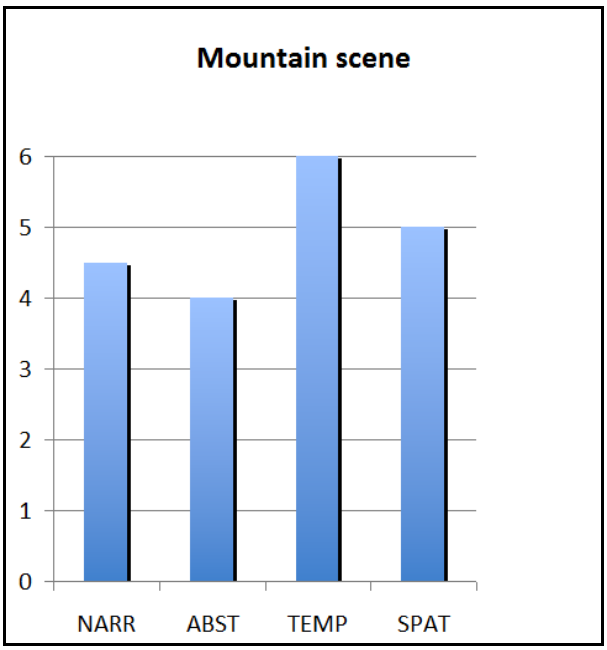
Spatial – tree creaks, wind

Figure 13g – Tree house scene, audio mix emphasis

8 – Mountain: **[01:10:49 to 01:17:15]** (Compass –e / -ri)

After his belittling and violent encounter with the bullies, Say travels purposefully towards the mountain, either ignoring or forgetting the arrangement he and Grace had made to meet up that morning. When he doesn't turn up, Grace has a hunch where he'll be and she goes to the mountain after him. There, high on a ledge, he once more reprises the decision that we saw in the first Act - whether or not to jump to his death. The weather worsens, but she finds him; and on the ledge, her unspoken yet loving presence brings about in him a change of heart. They have both simultaneously achieved *right mindfulness* and Say speaks freely of his father's fatal fall from the very same ledge, as though Say is released by her being there. In his confiding in Grace, he tells her that 'Everything changes. Everything…' And we see that everything does seem to have changed for them both. Whilst not quite the most negative or positive point of the film in emotional terms, this is the closest we have seen Say to suicide; and so this scene is intended to have the

most dramatic impact on the viewer, swinging from a low with Say's desperation, to a high following the scene's resolution in a kiss, that signifies that Say and Grace are ready to move on with their lives, and, metaphorically at least, escape the endless round of making the same mistakes, described by the Buddha as *Samsara* (the continual cycle of birth and death arising from mistaken concepts of self and experiences) which inevitably leads to *Dukkha* (suffering and dissatisfaction).



Narrative – dialogue

Abstract – wind

Temporal – score, wind gusts

Spatial – wind

Figure 13h – Mountain scene, audio mix emphasis

6.2.7 Observing the Four Sound Areas at work in the mix of *Here and Now*

Summarising the mix level values of the tables in *Figures 13a - 13h*, the *Narrative* and *Abstract* sound areas, over the course of the film, have equal emphasis with a mean average of 4.5, whilst the mean for the *Temporal* sound area was lowest at 3.4; the *Spatial* mean being 4.3.

Standard Deviation (σ)[19] figures were calculated to give a measure of variability and show that *Narrative* was the most consistent sound area with a zero deviation (it remained at a constant level) whilst *Temporal* showed the highest at 1.7, followed by *Abstract* at 1.2 and *Spatial* at 0.9.

This suggests that the *Narrative* area remained consistent throughout the film (this was predominantly the dialogue), whilst the *Temporal* and *Abstract* areas showed a tendency to 'swing' from scene to scene, to bring about a change in mood or pace. The *Spatial* area showed some swing, which would be consistent with the switch between sound in the surround channels and the reduction in the mix width and depth to solely the front stereo channels.

Also, within the individual scenes, the *Abstract* and *Temporal* areas are those that show the biggest change of mix emphasis within a scene; albeit at different times (*Abstract* highest in Scenes 1, the castle, and 4, the orchard; *Temporal* highest in Scene 8, the mountain.)

In *Here and Now* it is the *Abstract* and *Temporal* sound areas that show the greatest variation (measured with a standard deviation σ, of respectively 1.2 and 1.7) from one scene to the next, suggesting that at significant plot way-points, it was the *Abstract* and *Temporal* sound areas that were mostly used in the mix to convey a change in mood or direction. The σ for Narrative and Spatial areas in *Here and Now* is 0 and 0.9 respectively.

In soundtrack terms, this often meant the change of an atmosphere track from a close-up dialogue scene to that of a wide countryside vista, which was also accompanied by a change in the mood and tempo of the music.

[19] Sample Standard Deviation (σ) is being used here as a measure of the conspicuous loudness variability throughout the film.

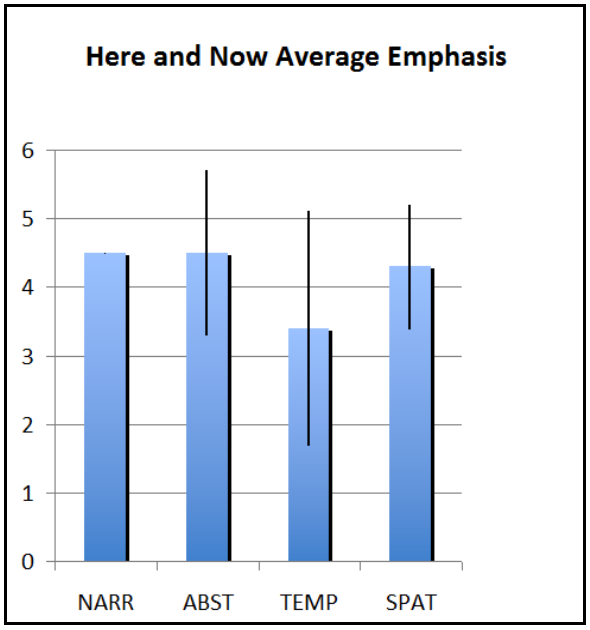


Figure 14 - Here and Now average emphasis level and standard deviation by sound area.

This tendency to find the emphasis placed on the *Abstract* and *Temporal* sound areas is broadly consistent with the figures observed in *The Craftsman*, where the standard deviation showed that it was again the *Abstract* and *Temporal* sound areas that varied the most (σ = 0.93 and 0.62 respectively), suggesting that for these two films at least, the most useful tools for the Re-recording Mixer when wanting to establish a change of pace, mood or direction, lay within these two sound areas (*The Craftsman* σ = 0.38 for the *Spatial* and 0.26 for the *Narrative* sound areas.)

When comparing patterns to create the emotional intent of the sound design and mix between *The Craftsman* and *Here and Now,* it can be seen that in *The Craftsman*, the negative designed emotions – e.g. 'suspense', 'shock' and 'despair' - had the same pattern of sound area presence in the mix (high *Narrative* and *Temporal*, but low *Abstract* and *Spatial*). Yet in *Here and Now*, the equivalent suspenseful, negative emotional intent (typified by the Cornfield scene) showed its highest scores in the mix for its *Narrative* and *Spatial* sound areas. This particular *Spatial* figure may, however, be influenced by the particular nature of the scene: a cornfield scene, with actors speaking as they walk through it, is as close to a perfect setting to demonstrate surround sound

as a Sound Designer and Re-recording Mixer might reasonably expect to find in a movie.

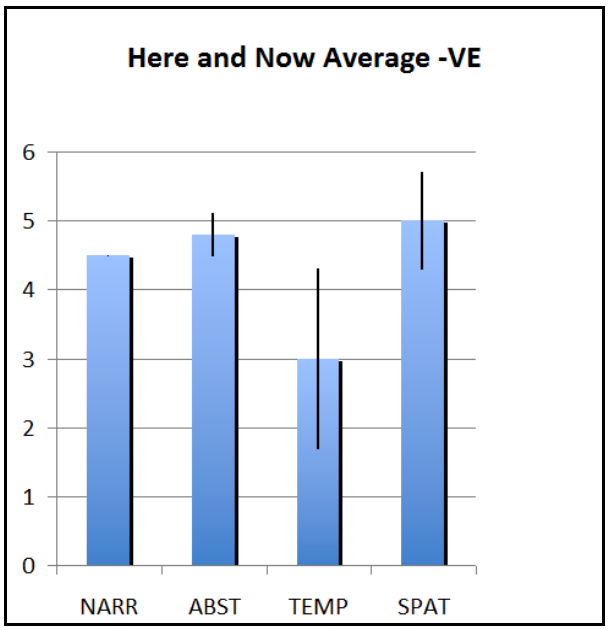


Figure 15 - Here and Now average and standard deviations of negative emotions.

The positive emotion that was designed for *The Craftsman*, ('hope'), had a markedly different pattern to those seen for the negative intended emotions: 'positive' showed a high *Narrative* and *Abstract*, followed closely by *Spatial*, but with a low *Temporal* score; compared to 'negative' showing high *Narrative* and *Temporal*, but low *Abstract* and *Spatial* scores; meaning that it was the *Narrative* and *Abstract* areas that showed most prominence when designing for a positive emotion.

However, in *Here and Now*, the positive intention designed for the river and orchard scenes showed that whilst the *Abstract* sound area remained prominent in the mix, in this instance the *Temporal* area replaced *Narrative* at the forefront of the mix.

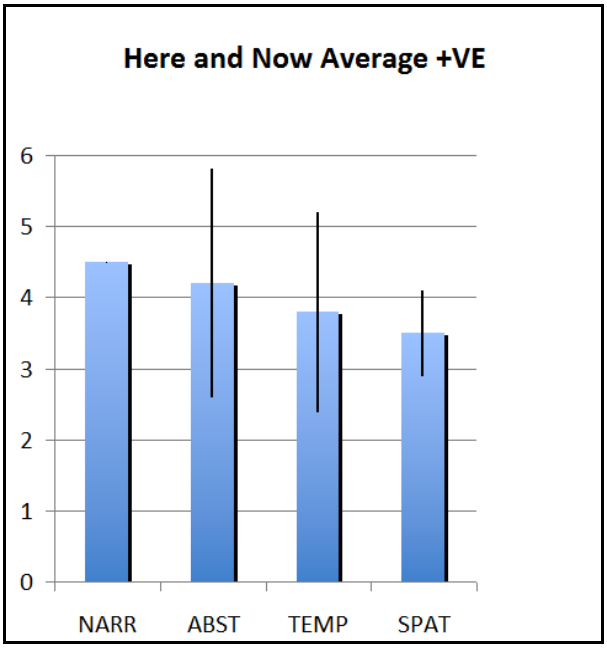


Figure 16 - Here and Now average and standard deviation of positive emotions.

6.2.8 Summary

On the basis of the analyses of these two films, albeit with both the sound design and mixing carried out by the same person, two suggestions are presented:

i) For negative emotions such as suspense, shock or despair, a Sound Designer, and in turn the Re-recording Mixer, might consider utilising and emphasising sounds with a highly *Narrative* nature;

ii) For positive emotions such as hope, affection, happiness, peacefulness or tenderness, the Sound Designer and Re-recording Mixer might benefit from utilising and emphasising sounds of a conspicuously *Abstract* nature.

6.3.1 Study 3: The XX Commonwealth Games, Glasgow (2014)

The author was engaged to be a Sound Supervisor at the two Commonwealth Games Boxing venues: Hall 4a at the SECC (for the appropriately termed knock-out rounds) and for the finals, the Hydro. Responsibilities included overseeing the choice, installation and rigging of the necessary audio equipment and then mixing the resulting broadcast audio output, synchronized to pictures, live to air. Whilst the arrangements for capturing sound at an Outside Broadcast (O.B.) event are very different to that of single-camera drama, it was important for this research to determine if there were any similarities between the desired and achieved emotional outcomes for these Outside Broadcasts, compared to the film dramas of this study; the clear intention being to find a consistent approach for all moving-picture production.

6.3.2 Microphone logistics

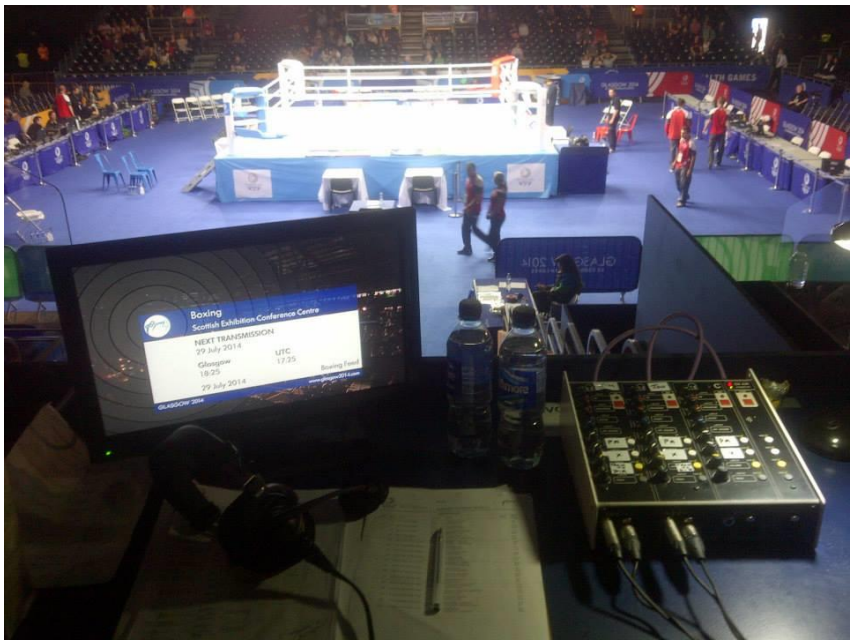


Figure 17: Host Broadcaster commentary position within the Hall used for the heats rounds; boxing ring and audience in background.

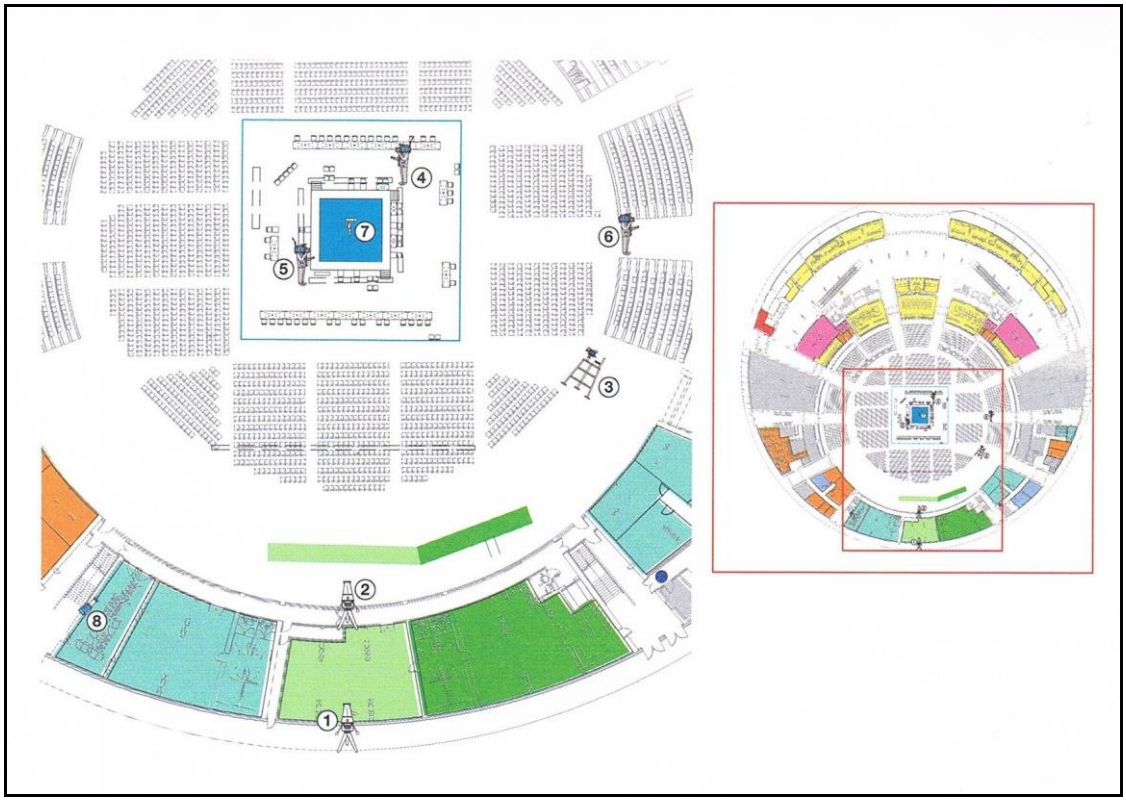


Figure 18: Camera plan for the Commonwealth Games Boxing finals

The sound design philosophy for the Boxing finals was based broadly on that of the tried and tested microphone rig of the heats (See Appendix 3), but with some adaptation: e.g. three stereo microphones were placed equidistant around the 270 degrees that the cameras faced in the Hydro arena, to cover the significantly larger audience; and the two super hyper-cardioid microphones, (still designated 'Near' and 'Far' with respect to the main fixed Cameras 1 and 2) had to be suspended from walkway gantries in the roof, further away from the ring than was ideal. However, these two compromises ensured success in negotiating with Production permission to change the commentary arrangements: the commentators were permitted to use lip-ribbon microphones as opposed to the thinner-sounding headset microphones of the heats (standard issue for the other Commonwealth Games sports). The headset microphones had also been susceptible to picking-up large amounts of crowd and Public Address (PA) ambience 'spill', which in turn, coloured the clean commentary circuit and the overall clarity and intelligibility of the mix (as well as influencing the emotional 'feel' of the commentary itself). Indeed, this change in the type of commentary microphone was crucial in establishing the

evocative nature of the Narrative sound area's exegesis speech, due in no small part to the choice of a Coles lip-ribbon microphone with its familiar, 'sound of sport' commentary characteristic.

6.3.3 Outside Broadcast mixing using the Four Sound Areas

Each of the heats sessions comprised of 14 fights and the bouts themselves had a particular, repetitive pattern. A rhythm soon became apparent in the nature of the mixing required; and after the first of the 10 days mixing it was apparent where emphasis was required in the live audio mix.

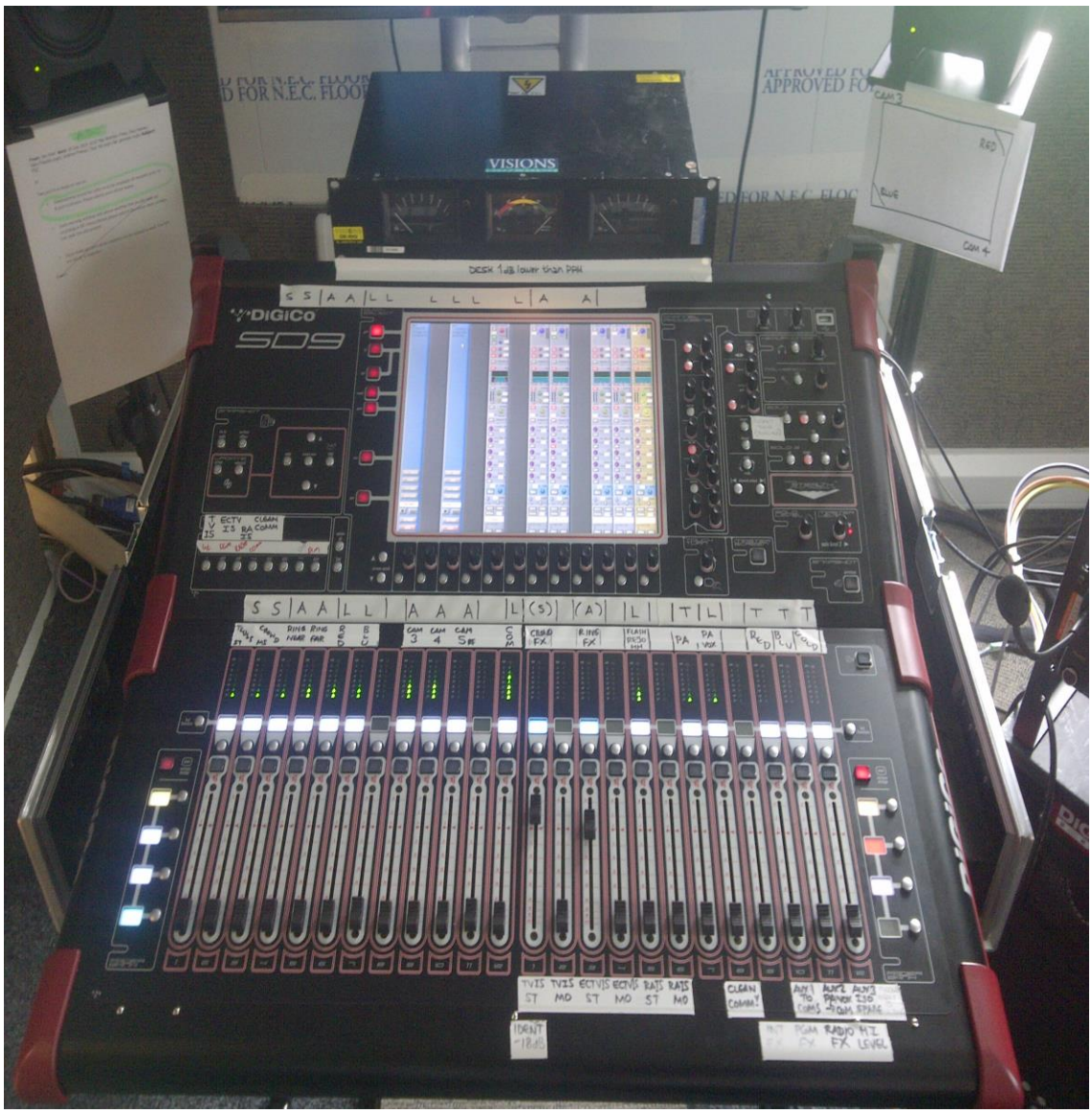


Figure 19 – Heats mixer inputs labelled by corresponding Sound Area. Note that the Narrative sound area was initially labelled 'Logical' (L).

Noticing which microphone faders were being ‘worked’ during a boxing bout, and which remained ‘set’, had the author thinking about the nature of the sounds being covered by them; and by day two, the desk inputs were labelled according to the corresponding sound area proposed by this PhD research; namely, either the Narrative, Abstract, Temporal or Spatial sound area.

The input labelling created on the mixing console channel strips is shown in Table 2:

(Sound source / microphone)	**(Sound Area)**
Crowd stereo wide Left / Right	Spatial
Crowd stereo Centre	Spatial
Ring Near	Abstract
Ring Far	Abstract
Red Corner	Narrative
Blue Corner	Narrative
Camera 3	Abstract
Camera 4	Abstract
Camera 5	Abstract
Commentary	Narrative
Crowd FX (group fader)	Spatial
Ring FX (group fader)	Abstract
Flash interview hand microphone	Narrative
PA High Level	Temporal
PA Vox	Narrative
EVS Red	Temporal
EVS Blue	Temporal
EVS Gold	Temporal

Table 2 – Mixing console sources and corresponding sound area label.

On day two, what sound areas were being ‘worked’ in the mix during the rounds of a bout were re-visited, to see if there was a relationship between the prominent sound area and the emotion the Mixer was attempting to convey. The balancing of any audio mix for moving pictures requires the Sound Supervisor / Mixer to make frequent and timely adjustments to the various audio elements; and in live television, as opposed to mixing in post-production, the luxury of stopping and rewinding to allow a re-adjustment or re-take does not exist.

Boxing is first and foremost a contact sport and it was important to not only convey the shocking realism and power of myriad wide-angle camera shots showing Abstract sound area punches (where it was not possible to clearly attribute single punch sounds to the visuals), but also to capture the visually attributable sounds of punches landing in close-up camera angles, by utilising the on-board microphones of mobile Cameras 3, 4 and 5. The sounds from these microphones being considered as part of the Narrative sound area: viewers clearly saw punches landing on the boxers’ heads and bodies - and the associated impact sound - accompanied by the excited and approving references to the sounds of combat from the Commentators (e.g. ‘Just listen to the sound of those punches raining down…’) at key moments in the action.

This effect of mixing Narrative impact sounds with more Abstract combat sounds was achieved by setting the ‘Ring Near’ and ‘Ring Far’ microphones at a specific level of amplification that was held steady during the round; whilst varying the output levels of the on-board shotgun microphones of Cameras 3, 4 and 5 that were capturing the Narrative sounds of gloves against gloves, heavy breathing, grunting and body blows that were clearly seen in these respective cameras close-up shots. The required level changes between these three camera microphones, achieved through real-time fader adjustment (the physical action of ‘mixing’), were large, and which of the microphones was increased in level to be the most prominent from moment to moment was dictated by which camera the boxing action was closest to. Cameras 3, 4 and 5 were given specific sides of the ring to cover and their operators were allowed to stand just outside the ropes of the ring, at the same level as the boxers;

which meant that good coverage was possible from their on-board, shotgun microphones - notwithstanding the merry dance that was being carried out by the Mixer's fingers on the faders.

The Abstract sound area inner-ring sounds were designed to act as a 'bed' that anchored the mix during the round; and they were used to convey to the listening-viewer at home a relentless, highly-emotive sense of controlled aggression; and the violent physicality of the sport.

Whilst the Narrative and Spatial sound areas were dominant in evoking emotion during the rounds (and to a lesser extent, so was the Abstract sound area), the predominant sound areas in use during the breaks between rounds and bouts were the Narrative sound area (there was much more content in the breaks from the Commentators, with their analysis of the previous round), along with the Temporal sound area (the PA system was playing loud, hard, fast-paced music to keep the crowd in an agitated state of excitement between rounds). This Temporal sound from the arena was kept present in the mix during the replays of notable action from the previous round, heightening the agitation for viewers at home in a similar fashion to the audience at the event.

What remained reasonably consistent was the level of the faders that controlled the crowd microphones, which provided the background stereo environment for the pictures to 'sit' within; and it was these microphones that constituted the Spatial sound area. Even though the crowd got louder and quieter in the course of a bout, this was exactly the same ebb and flow, rise and fall in volume that a spectator would experience sitting in the arena; therefore when making any adjustment to these levels, it was important *not* to obtain an artificially loud output level for this group of microphones, instead allowing them to 'breathe' naturally.

By labelling the faders on the mixing desk with the corresponding sound area's initial letter, (N, A, T, S - see *Figure 19*), it was easier to observe how the Four Sound Areas were being emphasised in the mix for emotional effect in the live transmission; and then later, it was possible to contrast how these sound

areas were utilised when mixing the live Boxing bouts, compared with *'The Craftsman'* and *'Here and Now'*.

With the boxing matches, the 'actively mixed' sound areas of the mix during the action were shown to have a presence of the Abstract sound area (from the fixed 'Ring Near' and 'Ring Far' microphones), but with a high and consistent level of Narrative sound area content (primarily the commentary and the combat sounds from the close-up, ring-side camera microphones) and the Spatial sound area (crowd effects). Between bouts, the use of the Abstract sound area fell dramatically in the mix and the use of the Temporal sound area rose, due to high levels of PA music being used to create excitement (and a distinct sense of disquiet) within the hall. Indeed, the Temporal sound area required careful balancing against the Narrative area commentary, to allow the listening-viewer at home to experience the arena's atmosphere, yet still hear the commentators' analysis with ease.

Figure 20 – The Author at Calrec Apollo mixing desk, labelled with the Four Sound Areas, mixing the 2014 Commonwealth Games Boxing finals.

6.3.4 Summary

Although using the Four Sound Areas shorthand 'N, A,T, S'[20] on the console certainly did not replace the need to name and group sources in the conventional way, e.g. 'crowd fx' or 'ring fx', which could be referred to as *'Primary labelling'*, the use of the Four Sound Areas nomenclature was extremely helpful as *'Secondary labelling'*.

Separating the two halves of the challenge for an Outside Broadcast Sound Supervisor / Mixer in this way seemed to give more clarity and focus; and also provided a visual feedback to better understand and check what was being arranged 'emotionally' within the live mix.

Using the Four Sound Areas of this thesis as a basis for the sound design and mix of a live-to-air sports assignment translated readily and easily to the task; and operationally, the framework functioned well. Labelling the mixing desk inputs with their corresponding and appropriate sound area was helpful in one particular aspect - it allowed the sound sources to be grouped simultaneously, in both a technical and a creative context; allowing an easier separation of the technical '*necessities*' (e.g. such as 'are the microphones working?', 'Can a signal get from one place to another?') from the '*niceties*' of delivering an emotional experience to the listening-viewer at home.

Comparing the sound design quadrant used for *The Craftsman* (*Figure 7*) and its development, the sound design compass used for *Here and Now* (*Figure 12*), showed what was intended to be emotionally evoked by the boxing coverage bore closest similarity to three specific scenes in *The Craftsman* (scenes A, C and D – 'Suspense', 'Shock' and 'Despair' respectively) and one scene in *Here and Now* (the 'Cornfield' scene).

As shown earlier, two suggestions presented themselves from the analysis of *The Craftsman* and *Here and Now*:

[20] Initially, the Narrative sound area was referred to as the Logical sound area. It can be seen denoted 'L' in the labelling of the sound desk in figures 19 and 20.

i) For negative emotions such as suspense, shock or despair, utilising sounds with a highly *Narrative* nature in the mix worked well;

ii) For positive emotions such as hope, affection, happiness, peacefulness or tenderness, the mix benefited from utilising sounds of a highly *Abstract* nature.

Therefore, the Sound Designer / Mixer's desired emotional effect for the sound design of the Boxing was for it to be overall emotionally 'negative'. From the earlier findings of *The Craftsman* and *Here and Now*, this should therefore mean that the sound areas most prevalent in the mix were the Narrative and Temporal sound areas (as in the case of *The Craftsman*) or the Narrative and Spatial areas (as in the case of *Here and Now*).

In fact, both situations were observed as each boxing bout moved between two distinct states: during the rounds and during the inter-round interval. During the round itself, the predominant sound areas at work in the mix were sounds from the Narrative and Spatial sound areas - e.g. Narrative: commentary, referee, timing bell, timing blocks and close-up punches; and Spatial: the crowd. (The Narrative and Spatial areas were also used to create *Here and Now*'s negative characteristics for the Cornfield scene). The Abstract sound area sounds of movement and general combat e.g. feet on canvas, non-specific punches and grunts were present, but much less prominent in the mix than those of the Narrative and Spatial sound area; whilst the Temporal sound area sounds were not engaged.

However, between rounds, the Abstract and Spatial sound areas were greatly reduced in the mix; and it was the Narrative and Temporal sound areas that were the most prominent - e.g. Narrative: the Commentator's analysis, overheard instructions to the boxers from the trainers in the corners, the signal of the start-of-round bell; and Temporal - the high-energy music played loudly to the crowd from the arena PA. These were the same sound areas used to create negative emphasis in *The Craftsman*.

6.4 Conclusions

This chapter has presented how the Four Sound Areas framework was used by the author in the creative practice pieces presented in this PhD. Chapter 7 presents the author's main reflection on the practice pieces *The Craftsman*, *Here and Now* and Commonwealth Games Boxing.

7 Reflections on practice

7.0 Introduction

In this chapter the author offers self-critique on the practice pieces of this PhD by Practice, compares the differences in the use of the Four Sound Areas in those practice pieces, presents comments from film critics relating to the movie *Here and Now* and discusses the differences and considerations when creating a sports Outside Broadcast mix compared to a drama mix.

7.1 The sound design and mix for *The Craftsman*

Central to the mixing philosophy of *The Craftsman* was the desire to provide 'effortless intelligibility' for the listening-viewer with regards to speech. However, as stated in Chapter 5, it is important to emphasise that dialogue does not constitute the entire Narrative sound area of this film; in the same way that the Abstract sound area does not only equate to sound effects.

However, in executing the mix for this film, one particular part of the Narrative sound area - the actors' dialogue - remained monophonic throughout by intent; providing a greater degree of separation in the mix from the atmospheres used within the Abstract sound area and the music used within the Temporal sound area, affording it a clear avenue of direct communication.

The *amount* of sound from the Narrative, Abstract, Temporal and Spatial sound areas in use at any one time changes frequently in a mix, as these Four Sound Areas are continually re-balanced against each other by the Re-recording Mixer; and the decisions behind which sound area has precedence over another at any particular moment of the mix, means that the subjective *balancing* of the four soundtrack elements has a significant impact on what might be considered as the overall sound design.

A challenge exists in how to graphically represent these instantaneous and moment-to-moment changes, as a soundtrack differs to a picture track by virtue of it being silent at any moment of a freeze-frame - the sound itself can only be auditioned by it moving; by the soundtrack playing over a designated period of time. One solution was for the full soundtrack to be broken down into its four separate sound areas, whose audio stems could then be output as four

individual waveforms, which in turn, could be examined and compared over a common time-line.

Figures 21a and *21b* demonstrate such an arrangement for Sections A and B of *The Craftsman* soundtrack. In each figure, the top stereo track is the waveform of the Narrative sound area (initially called Logical), the middle stereo track is the Abstract sound area and the bottom track is the Temporal sound area. Note that the Spatial sound area has been intentionally omitted for clarity in *Figures 21a* and *21b*, as the waveforms show very little variation for the two chosen scenes.

The objective is to give an impression of the relative *balance* of the sound areas, and these screen shots show interesting variations in the Narrative, Abstract and Temporal areas (the top, middle and bottom traces respectively) between the dynamic opening Section A and the serenity of Section B.

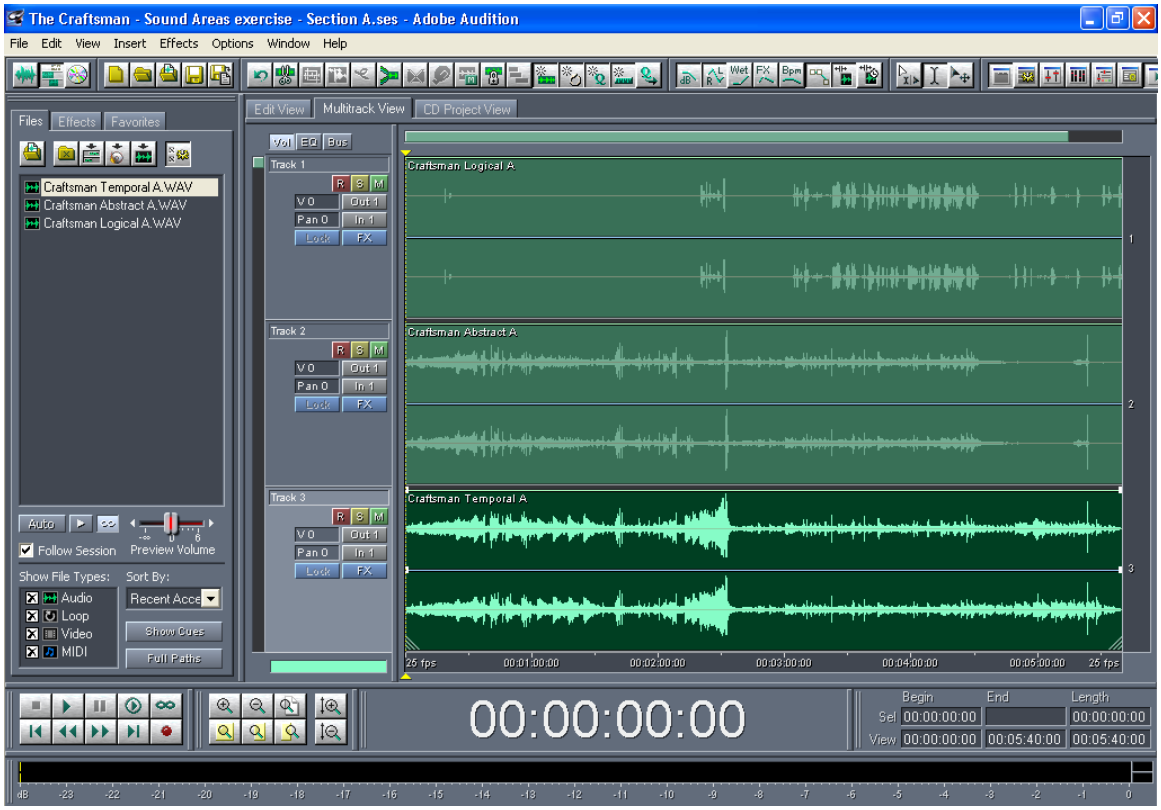


Figure 21a The Craftsman Section A: Narrative, Abstract and Temporal areas.

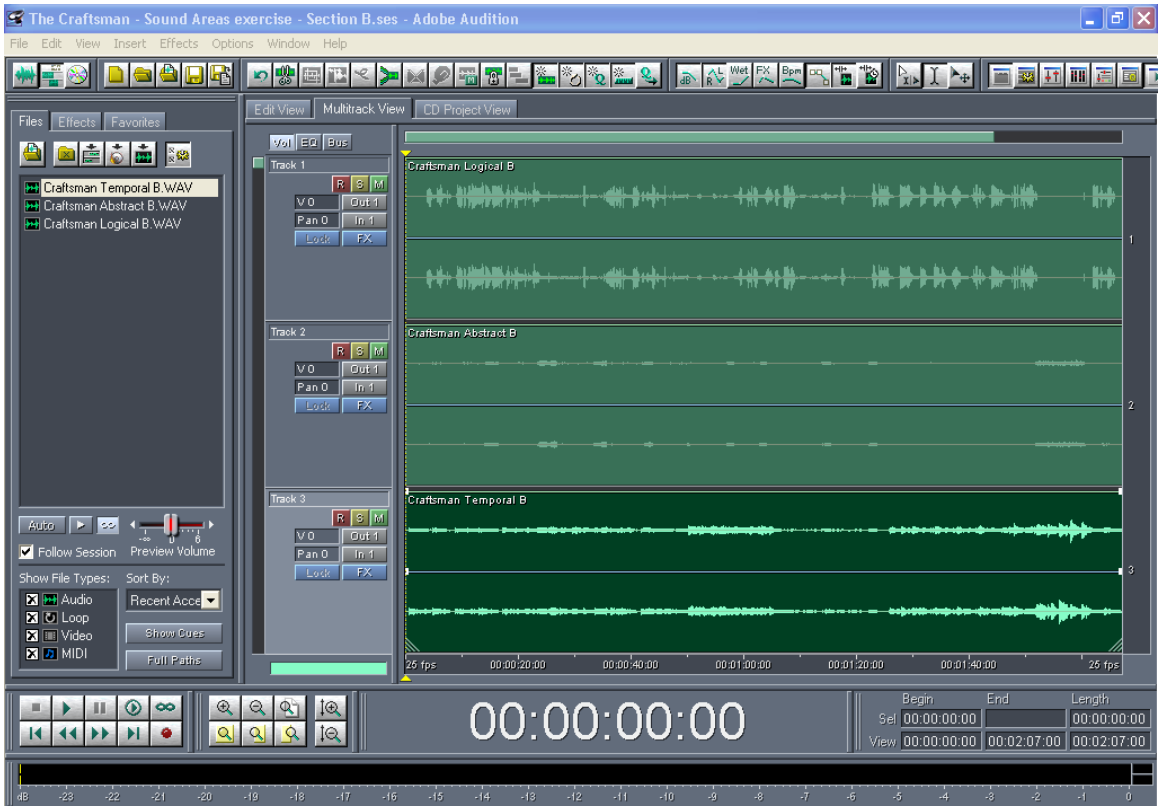
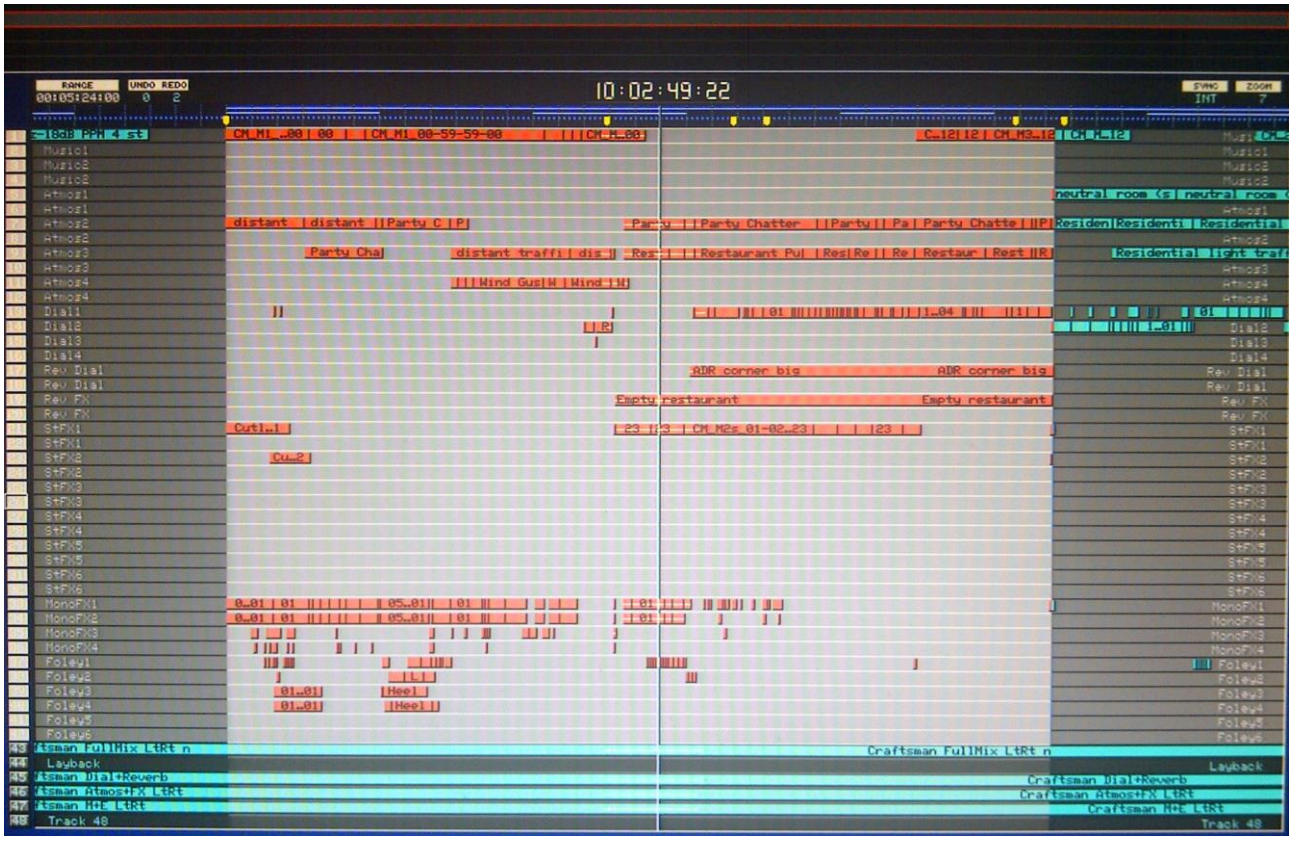
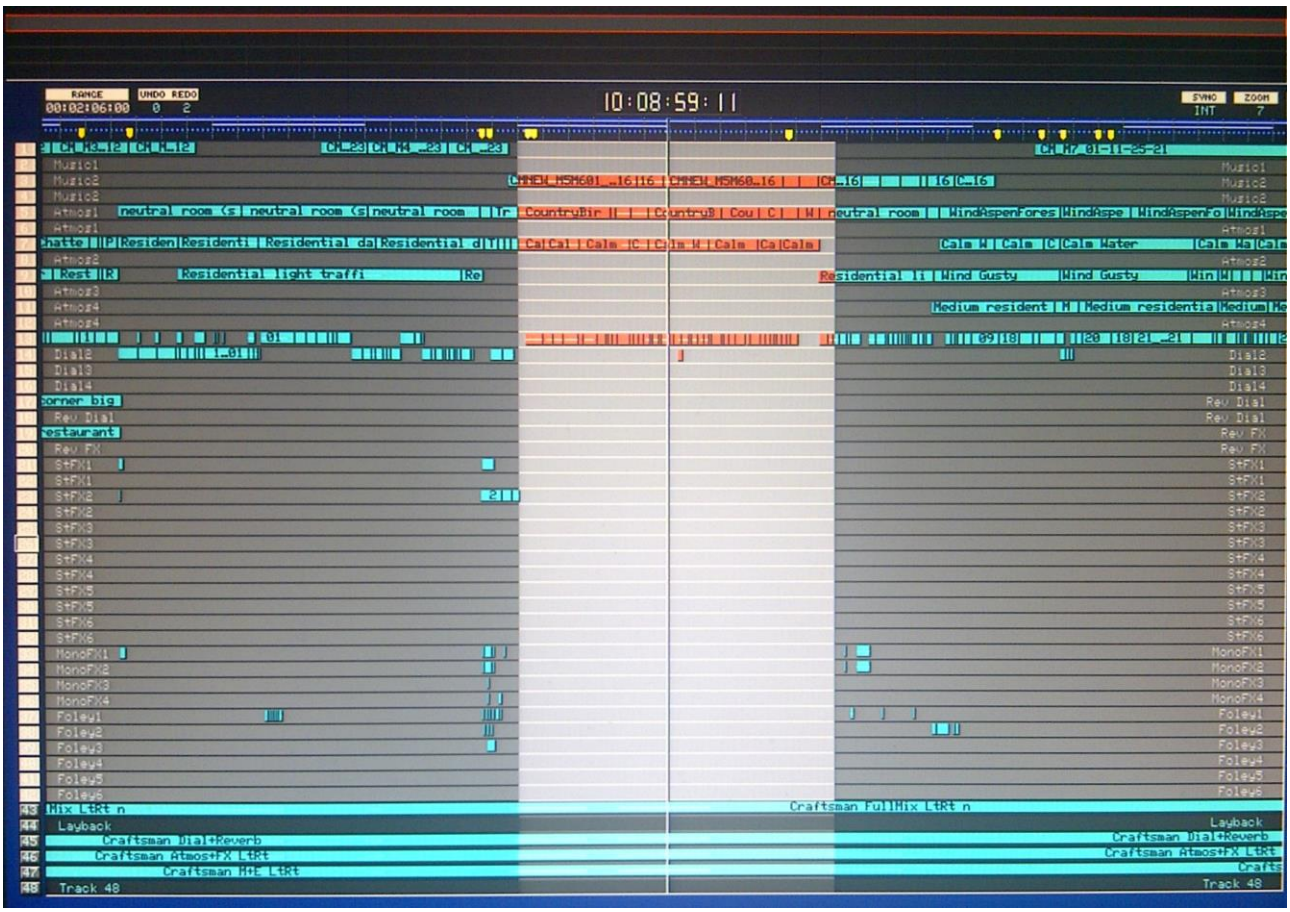


Figure 21b The Craftsman Section B: Narrative, Abstract and Temporal areas.



Figures 22a and 22b – Dense soundtrack for Section A (highlighted above) [duration 05' 24"]; much sparser for Section B (highlighted below) [duration 02' 06"]. (See also Table 3.)



Another viewpoint is provided by the Fairlight Prodigy II audio editor screen-grabs (*Figures 22a* and *22b*), which show the contrast between Sections A and B; this time the difference is in audio clip density: it can be clearly seen that more individual sound clips were used to create the soundtrack in Section A, than in Section B. Table 3 shows this track layout.

Channel	Stereo / Mono	Section A	Section B
Music 1	Stereo	ON	
Music 2	Stereo		ON
Atmos 1	Stereo		ON
Atmos 2	Stereo	ON	ON
Atmos 3	Stereo	ON	ON
Atmos 4	Stereo		
Dial 1	Mono	ON	ON
Dial 2	Mono	ON	ON
Dial 3	Mono	ON	
Dial 4	Mono		
Rev Dial	Stereo	ON	
Rev FX	Stereo	ON	
Stereo FX 1	Stereo	ON	
Stereo FX 2	Stereo	ON	
Stereo FX 3	Stereo		
Stereo FX 4	Stereo		
Stereo FX 5	Stereo		
Stereo FX 6	Stereo		
Mono FX 1	Mono	ON	
Mono FX 2	Mono	ON	
Mono FX 3	Mono	ON	
Mono FX 4	Mono	ON	
Foley 1	Mono	ON	
Foley 2	Mono	ON	
Foley 3	Mono	ON	
Foley 4	Mono	ON	
Foley 5	Mono		
Foley 6	Mono		
Layback	Stereo		

Table 3 – Fairlight Prodigy II track layout for mixing The Craftsman.

These screen shots of the DAW's audio editor display (in *Figures 22a* and *22b*, with the active audio tracks listed in *Table 3*) may not necessarily have a direct relevance, but it is interesting to show and compare the clusters of individual clips that make up the soundtrack at two different emotional points in the film. What is interesting to note with this visualisation is the contrast in the density of the clips, e.g. the number of sound clips used by the Sound Designer to evoke emotions in a scene calling for tension and suspense, (the overriding emotions designed for Section A) compared to the number of sound clips used to evoke emotions in a scene portraying peacefulness and serenity (the overall intended emotion for Section B).

From the difference in the number of sound clips used in Section A compared to Section B, it would seem to suggest that a Sound Designer must work harder in terms of the number of sounds required to support their attempts to evoke tension and suspense, than to evoke peacefulness and hopefulness; and the extra concentration of clips can be seen to occur predominantly in the Narrative and Abstract areas of Section A, leading up to 'the kill', before the release of tension occurs.

This release of tension in the scene is also identifiable in *Figure 21a,* as a peak or 'spike' in level for both the Narrative and Abstract sound areas, and as an evolving crescendo in level for the Temporal sound area, occurring at the end of the first half of the opening scene.

One other interesting result from plotting the relative levels of the sound areas at various points throughout the film is that the Abstract sound area appears to only make a significant impact on the soundtrack in Section B. Given that the film throughout addresses fairly deep emotional issues, this may be surprising; and an attempt was made to determine what was different about Section B, compared to the other sections.

The soundtrack during Section B is markedly different in what it is attempting to convey emotionally, compared to the other sections: e.g. affection, happiness, peacefulness, tenderness, hopefulness; and indeed Section B does sit as an outlier on the Sound Design compass. It is alone in being positive in both the intended reaction/impact on the listening-viewer and

its planned steering of their emotions; the sound design in accord with the Director's aim of this being the only self-contained scene of hopefulness and renewal – one that provides respite from the otherwise omni-present shadow of death, inferred either by Albert's trade or by Celia's terminal illness.

7.2 The emotional intent for the sound design and mix of *Here and Now*

In the UK, *Here and Now's* release was met with critical acclaim: it was named by respected cinema writer and critic Mark Kermode as his 'film of the week' on the July 4th, 2014 edition of the BBC Radio 5's *Kermode and Mayo's Film Review* show; and Kermode's review directly addresses the soundtrack:

> The film has wonderful pastoral imagery and there's also a nice musical motif that goes on. At the beginning she [Grace] has these headphones in, it's all urban noise; and as she gets out into the countryside you start to hear people playing fiddles in bucolic under-tree settings and there's a moment when he [Say] takes her to a cave and he plays a harmonica so she can hear the sound of the acoustics echoing. (Kermode and Mayo, 2014)

And he reprises his approval for the film in the July 6th 2014 edition of *The Observer* newspaper, again referring to the mixing of the soundtrack:

> As the headphones come off and real life filters in […]
> (Kermode, 2014);

Whilst Peter Bradshaw writing in *The Guardian on-line* on July 3rd, 2014 described it as:

> An intelligent and attractive film. An impressive debut feature from Writer-Director Lisle Turner that's well acted. (Bradshaw, 2014)

Total Film magazine's reviewer James Mottram also approved, writing:

> Lisle Turner manages to capture both the rhythms of rural life and the sharp pangs of adolescence with a quiet assurance. Modest but moving. (Mottram 2014, p.53)

The purposely rustic and simplistic sound design, carried through to the mix, would therefore seem to have worked overall, and it serves the pictures well; but it may be argued that the soundtrack functions primarily by virtue of only two of the four available sound areas throughout most of the film.

For instance, the dialogue remains at a constant perceived level and firmly in the Narrative sound area throughout the film; and the music score *almost* never leaves the Temporal sound area (two exceptions being when it is used in the Abstract sound area, as a mysterious beginning to the Cave scene as Say and Grace approach and then climb down into the cave; and then immediately afterwards, inside the cave, the music takes a place in the Spatial sound area, as Say's rendition of *Amazing Grace*, played on his harmonica, reverberates around the cave).

Whilst these two sound areas alone (the Narrative and Temporal) can - and do - tell the bare story, they do so in almost complete isolation from the images on-screen; presenting what might be described as a form of 'sonic *tableau vivant'*. The Narrative and Temporal sound areas are detached from the landscape that both underpins the story's visual environment and highlights the differences between the different worlds that Say and Grace, metaphorically at least, inhabit. These two sound areas alone provide sounds that fulfil the narrow, although indisputably important, role of a top-level descriptive function; but put simply, in this film it could be said that the Narrative and the Temporal sound areas are being used in the mix to tell the listening-viewer *how* to feel, by limiting the range of emotional intent being presented in the Narrative sound area and the reduced emphasis on Abstract sound area sounds.

But the actual contextual and emotional engagement with the plot – a deeper level of *what* the Sound Designer / Re-recording Mixer would hope that a listening-viewer might feel - is left in the hands of the *Abstract* and *Spatial* sound areas e.g. the archetypal surround-sound example of walking through a

cornfield, with head-high stalks swishing and parting around and behind, immerses the listening-viewer. Or the activity sounds of the wasps, bees and fruit flies that are in the orchard scene, place the picking scene - and therefore the listening-viewer - at a particular and distinctive time: the end of the summer fruit-growing season in England. On the one hand, the Narrative and Temporal area sounds in the mix strictly prescribe the emotional experience; on the other, the Abstract and Spatial area sounds within the mix encourage a more interactive and personal interpretation of what is presented on-screen.

Aside from the soundtrack itself, it is also interesting to note that arranging the console for mixing this film and *The Craftsman* would be far less straightforward in its layout in relation to the Four Sound Areas, compared to the way in which the Four Sound Areas were used for mixing the Commonwealth Games Outside Broadcast events.

As opposed to delivering the narrow sonic soundscape of a sporting occasion like a football or boxing match, a filmed drama encompasses a much wider range of situations and places that fictional characters are required to inhabit (or more importantly, that the listening-viewer will believe them to inhabit); with myriad sound cues used within the mix to evoke, suggest and reinforce an emotional engagement of on-screen events and circumstances.

7.3 The treatment of the Outside Broadcast sport mix compared to mixing the film dramas

In the cases of *The Craftsman* or *Here and Now*, it would not have been logistically advantageous to secondary label the mixing desk channel faders in the same way as for the Outside Broadcast desk, with the designators N, A, T and S (Narrative, Abstract, Temporal and Spatial) used to signify the sound area that they routed. This, it is suggested, is because in a sporting context each sound *source* is usually just fulfilling one distinct function within the framework of the Four Sound Areas; whereas in a drama situation, sounds are much more likely to move freely between sound areas in the quest to evoke audience emotion and arrive at the console from many more multiple track-sources.

One other explanation for this difference between the usefulness of labelling of an Outside Broadcast console and a mixing desk for drama could also lie in the concept of *Narrative Fit* and *Functional Fit*, often seen working together in Gaming sound (Ekman, 2014).

Applied here as a comparison between the fictional dramas of *The Craftsman* and *Here and Now* and a real sporting event, the dramas may be considered to utilise *Narrative Fit*, whilst the sporting event requires a soundtrack that satisfies *Functional Fit*.

In drama, the sounds used to deliver an enhanced understanding of the story – the Narrative Fit – can often produce a strong source of emotion in the listening-viewer. Ekman suggests:

> The most pivotal sounds in film are typically refined to give the sound extra emphasis, loading them with narrative, connotative and symbolic meaning, and enhancing their attention-grabbing effect. (Ekman, Ibid.)

Conversely, comparing sporting event sound with that of the Functional Fit sound utilised in gaming, may not at first seem like a likely match; but the bringing together of simple, discrete sounds, that are then grouped together to form the whole soundtrack – as in the direct use of Narrative, Abstract, Temporal and Spatial sound area sources – and labelled as such on the mixing console (as in the case of the Outside Broadcast sport example), does suggest a relationship to Ekman's thoughts on Functional Fit; e.g. sounds that will be frequently repeated, such as a referee's whistle, a starting gun, a timing buzzer or bell, or an Umpire's voice delivering the match score. Ekman expands this point:

> The driving factor for creating functional fit is to consider the utility of sounds for play […] sounds are overly simplified, grouped

> together, and tend to match game actions categorically with earcons[21] or auditory icons[22]. (Ekman, Ibid.)

Overall, the sound design for the Commonwealth Games boxing provided the kind of aural experience that the Production team demanded, and the mixes delivered the emotional experience that the author was looking to convey.

However, given more access and time to place extra microphones in and around the field of play would have undoubtedly provided the opportunity to further enhance the sounds of combat from within the ring; with the possibility of an associated increase in the extent of the emotions experienced by viewers, such as: a larger involvement and interest on the positive side, or greater disgust and repulsion on the negative side, through more clearly hearing the sounds directly associated with the shockingly violent nature of this sport (and depending on the viewer's own stance on boxing). This approach to coverage however would almost certainly have resulted in an experience too graphic for a general television audience, and therefore unsuitable for the kind of broadcast coverage required for the Commonwealth Games.

But still, this kind of enhanced coverage is 'real'; and in stark contrast to the practice of enhancing the sounds of a sport artificially.

In the televised rowing events at Sydney 2000, the Olympic Broadcasting Services Head of Sound Dennis Baxter played-in the sampled sounds of oars cutting through water, along with boat movement and crew murmur recorded from earlier, un-televised practice sessions, which were free from the noise and colouration of engines from motorboats and helicopters that were being utilised as mobile camera platforms (Sullivan 2012). Baxter defends this policy:

> 'Some people think it's cheating. I don't think I'm cheating

---

[21] An earcon is a sound of short duration, usually musical in nature such as a 'beep', which indicates or communicates that an event has taken place, typically within a computer system. It is a play on words from the visual term 'icon', and its pronunciation in English, 'eye-con'.

[22] The term auditory icon was coined by Bill Gaver in the early 1980's during his research into the use of sound for Apple's file management application 'Finder'. Similar to the earcon by providing feedback in computer-based user interfaces, the auditory icon uses everyday sounds to denote events and actions. The term has become commonplace in the shifting world of digital and is deemed the sonic equivalent to visual icons seen within most operating systems. (Gould 2016)

> anybody,' he says. 'The sound is there. It is the exact sound. It's just not necessarily real time. Because of the laws of physics, you've got one noise masking another noise. So... When you see a rower, your mind thinks you should hear the rower and that's what we deliver.' (Ibid.)

Baxter's approach to sound design in this example – artificially representing the sounds of oars on live sport footage – can be seen as an example of an emotion-based sound design decision: delivering what the listening-viewer expects to hear, as opposed to what they would actually hear in real-time from microphones covering the event. And whilst Baxter's approach may be no different to that of mimed musical performances on television variety shows, what can be argued is that this clearly demonstrates an approach to sport sound design that is expressly intended to enhance the listening-viewer's emotional experience. Through a clear aural representation of what is being shown on-screen, the desire is to create emotions that include feeling a greater involvement and interest, as well as enjoyment and pleasure.

This is precisely what UK broadcasters such as BT Sport and Sky Sports are keen to provide to their subscribers - at a premium price - through the introduction of Dolby Atmos soundtracks, alongside their Ultra High Definition (UHD) '4k' pictures (Dziadul 2016, Langridge 2017 and Martin 2017).

Baxter broke the mould in the Sydney Olympics by faking the actuality coverage of the event taking place; but the blurring of such a boundary, in the name of enhancing the listening-viewer's emotional experience, comes down to whether the objective of sound for sport is to deliver reality, an enhanced reality, or to embrace the stylised concept of Baxter's falsified sounds. Each has its own merit or morals, but is at least testament to the desire, within sport at least, for conspicuous, emotion-based sound design.

Two other observations can also be made on the differences in sound designing for emotional effect at a sporting event, compared to a feature film: one is that the Sound Designer / Re-recording Mixer is usually looking to only convey a single overarching emotional experience to the listening-viewer of a

sporting event: including a sense of heightened reality of actually being at the event, of simultaneously being surrounded by other people, but with a privileged access to the sounds usually heard only by the participants on the field of play. This is in contrast to a possible gamut of emotions that are presented to the audience of a filmed drama through the mix.

Secondly, the sound of the audience at a sporting event - the crowd's reactions to the event itself - is an integral part of delivering the emotional experience to television viewers. Conversely, the sound of the audience's reaction to a cinematic presentation does not function as a part of the sound design.

The underlying factors that influenced the mixing of the three practice pieces of this PhD by Practice might be considered as being so different in nature that the objectives for the *Craftsman* and *Here and Now* soundtracks are somewhat at odds to that of the Commonwealth Games boxing Outside Broadcast.

Whilst it is the case that creating and mixing soundtracks for a live sporting event is fundamentally different to the process of mixing sound for fictional drama, it is central to this thesis that as far as creating and mixing sound is concerned, the linking factor for all genre of moving pictures is about achieving an enhanced emotional engagement with the audience; be it the 'realities' of covering a sporting event, a documentary hoping to bring about social change, or a production in the 'Reality TV' category where the filming of ordinary people going about their ordinary business is viewed as being more akin to entertainment, than it is to the delivering of information about the subjects. Filmed drama meanwhile works to create a sense of reality from a fictional subject.

Therefore, the congruency between the soundtracks of all three pieces comes from the use of the Four Sound Areas framework of this thesis and from the desire to deliver an enhanced emotional experience for the listening-viewer.

7.4 Conclusions

In this chapter, the author has presented the main reflections on the creative practice that form the main output of this PhD work. In Chapter 8, conclusions from this study are discussed, along with possible future work.

8 Conclusions and future work

8.1 Conclusions

The research questions that this investigation set out to answer are:

> Can the emotional impact of a film scene can be affected by balancing the mix of a soundtrack's sound design elements in specific ways?
>
> Can a practical framework be developed to help facilitate the induction or enhancement of specific emotions in an audience via the mix-balancing of sound design elements by the Re-recording Mixer?

In the context of this research, a practical sound design framework was proposed. In the framework, a soundtrack is considered in terms of its Narrative, Abstract, Temporal and Spatial components. It was further proposed that the mix-balancing of these Four Sound Areas can influence the emotional impact of the film or audiovisual work for an audience. This framework was used, both as a conceptual and practical framework, to mix the soundtracks of a short film *The Craftsman*, a full-length feature film *Here and Now*, and to steer the mixing of live, televised Boxing matches. A subjective analysis of the practice was carried out in order to reflect on the impact of using this framework to facilitate emotional sound design.

As a Practitioner, the main results found by the author using the Four Sound Areas framework on the examples contained in this thesis, and also the examples of work presented in the accompanying Professional portfolio, are:

> i) The four sound areas framework is simple to integrate into the established and existing workflows for audio post-production.
>
> ii) It is equally suitable for use by sound editors (e.g. whilst preparing soundtracks for later mixing – i.e. a 'bottom-up' *tracklay*) and sound mixers (e.g. a Re-recording Mixer receiving the output of a Sound Designer / Supervising Sound Editor i.e. a 'top-down' *mix*).

iii) changes in mix emphasis are more easily arranged by connected sounds being grouped into the Four Sound Areas of Narrative, Abstract, Temporal and Spatial.

iv) it can also act as a useful framework for Picture Editors to more easily consider emotive sound design at the picture editing stage, enabling the audio elements of a timeline to be structured in a cohesive way for the audio post-production stage.

8.2 Adding to the lexicon of post-production.

The reality of operating as a creative sound practitioner on television or feature film production is that you rarely start with a figurative blank canvas; and from the point at which the post-production sound department will be brought on to a project, a skeleton or temporary soundtrack will already have been born. Several significant decisions that can impact on the overall sound design might already have been made: e.g. the pace of a scene's cutting; takes chosen that better suit the aesthetic of the visual than the aural; temporary sound effects put in place by the picture editor; similarly, the use of 'temp' music in the absence of the commissioned score; all of these being things that can impact on the final mix and limit the creative options of the Re-recording Mixer.

In short, it is an inescapable truth that the vast majority of moving picture soundtracks, such as those for commercials, television drama documentaries - as well as feature films (but to a somewhat lesser extent) - actually have their genesis not under the control of a Sound Designer, but of a picture editor, maybe even before the Supervising Sound Editor is engaged and possibly before the individual sound disciplines of dialogue and ADR editors, sound effects editors, Foley editors and music editors are brought on to start work.

When it is the case that the sound department are working with the *fait accompli* of supplied audio, the creative space is predominantly within the mix: by the balancing of the supplied sound elements and driven by the emotional interpretation and physical crafting of the Re-recording Mixer. (See the *Age of Airplanes* alternative mixes example presented on DVD 1).

Which is why presenting the final mix to a Director who is more familiar with several weeks of listening to the picture department's (arguably) less appropriate balance of sound effects and music can sometimes come as a rather uncomfortable, or even unwelcome, revelation.

But where such discomfort or disharmony does occur between the Re-recording Mixer and the Director, perhaps through a disagreement on a finer point of the plot, or a misunderstood directive, reference to the Four Sound Areas framework could go some way to help a Director or Picture Editor to convey more easily – and the Re-recording Mixer to understand more readily – the emotional direction that was in mind when a scene was written, shot, track-layed or cut.

Whilst the trade shorthand or technical terms used routinely by the sound department are not necessarily the most effective way for non-sound professionals to communicate and share their artistic aspiration, a widespread understanding and integration of the Four Sound Areas framework could allow Directors or Editors to ask the Re-recording Mixer (or agree with the Sound Designer at the spotting session) if the mix of a particular scene or event may be, for instance, steered more towards the Abstract sound area rather than the Narrative sound area, or vice-versa.

With these considerations in mind, a visual aid for use alongside the Four Sound Areas is proposed, based on the Geneva Emotion Wheel (GEW) self-reporting tool (see Scherer (2005); Scherer, Fontaine, Sacharin, & Soriano (2013)). The GEW is shown in its original form in *Figure 23*.

The GEW displays a range of 20 emotion types, with an intensity ranging between 1 (lowest) and 5 (highest) and this basic template would allow the Director and Re-recording Mixer to discuss and refer to the emotional descriptors set around the periphery of the Geneva Emotion Wheel, as a way to specify and map the kind of emotional experience intended scene by scene.

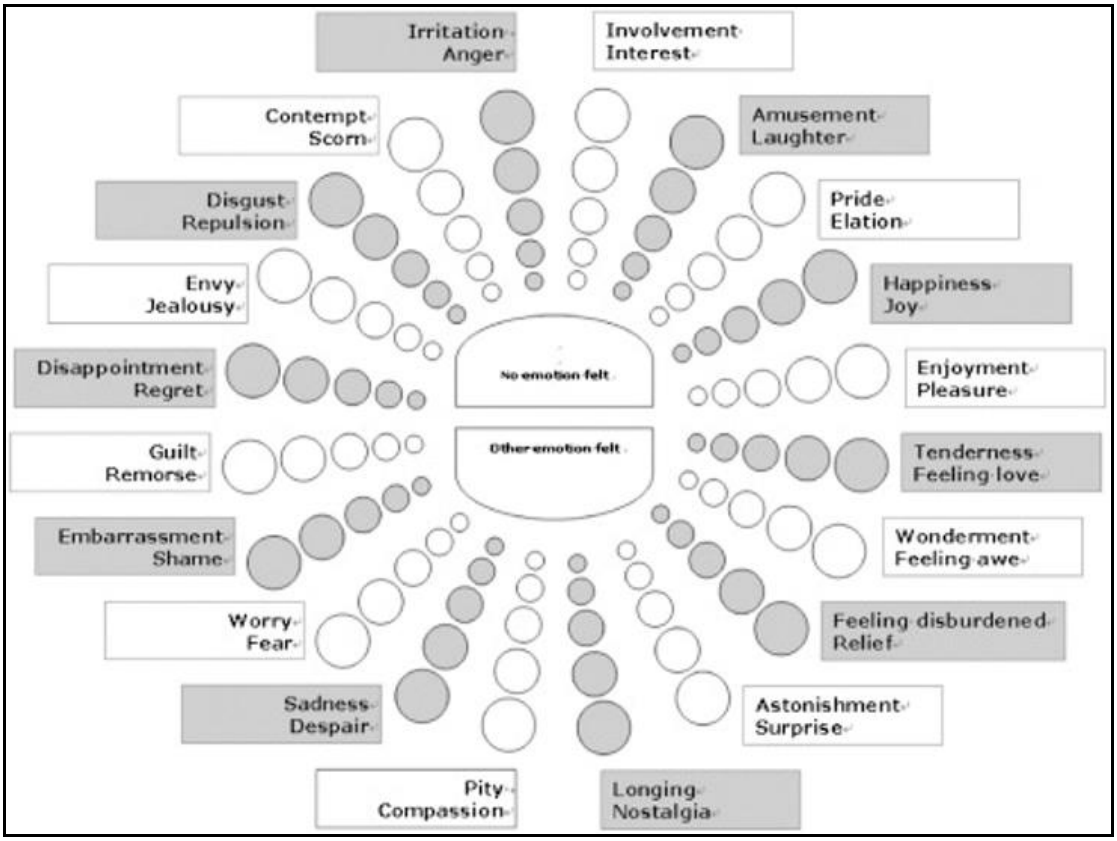


Figure 23 – Monochrome Geneva Emotion Wheel.

Moving forward from the basic template of *Figure 23* (and as a precursor to the proposal of a new industry 'working model'), coloured quadrants were introduced to the standard monochrome Geneva Emotion Wheel, inspired by the use of colours on the GEW in Sacharin, Schlegel & Scherer (2012). These coloured subdivisions have some correspondence to the forerunner diagrams used in *Figure 7* (the sound 'quadrant' used for *The Craftsman*) and *Figure 12* (the development of the sound 'compass' used for *Here and Now*); and are intended as an aid to better visualise the Sound Designer and Re-recording Mixer's intended emotional experience.

Figure 24 is an interim illustration to show the quadrants coloured Yellow, Green, Blue and Red, bisected by an x and y axis that represent a range between 'unpleasant' and 'pleasant' (negative and positive emotions) on the x axis, and low and high 'control' on the y axis (Valence). An emotion that is considered unpleasant (or negative) or pleasant (or positive) is represented by which half (hemisphere) of the GEW an emotion descriptor is situated on: the

left half representing negative emotions, the right half positive. The degree to which the emotion is felt remains the same as the original GEW scale – between 1 (lowest) and 5 (highest); and in *Figure 24* this is shown as a conceptual y-axis representing a control level of each emotion.

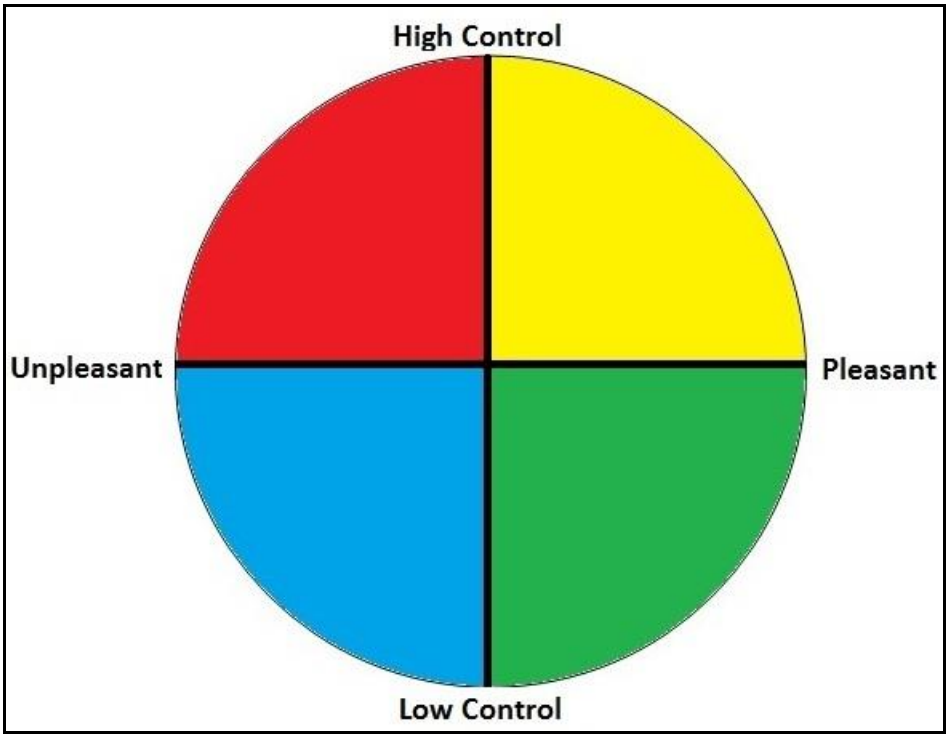


Figure 24 – GEW emotion sectors categorised by colour.

The final adaption of the GEW model by this study, shown in *Figure 25*, is the proposed *Four Sound Areas Framework Mix Wheel* and is proposed for use by Directors and Sound Designers in spotting sessions. Easily reproduced and printed, it is intended that this should form part of the spotting session notes and accompanying paperwork. It can be seen that Yellow (emotions 1 to 5) corresponds to the GEW descriptors that represent positive emotions with a positive reaction / impact index; Green (emotions 6 to 10) corresponds to the GEW descriptors that represent positive emotions with a negative reaction / impact index; Blue (emotions 11 to 15) corresponds to the GEW descriptors that represent negative emotions with a negative reaction / impact index; and Red (emotions 16 to 20) corresponds to the GEW descriptors that represent negative emotions with a positive reaction / impact index.

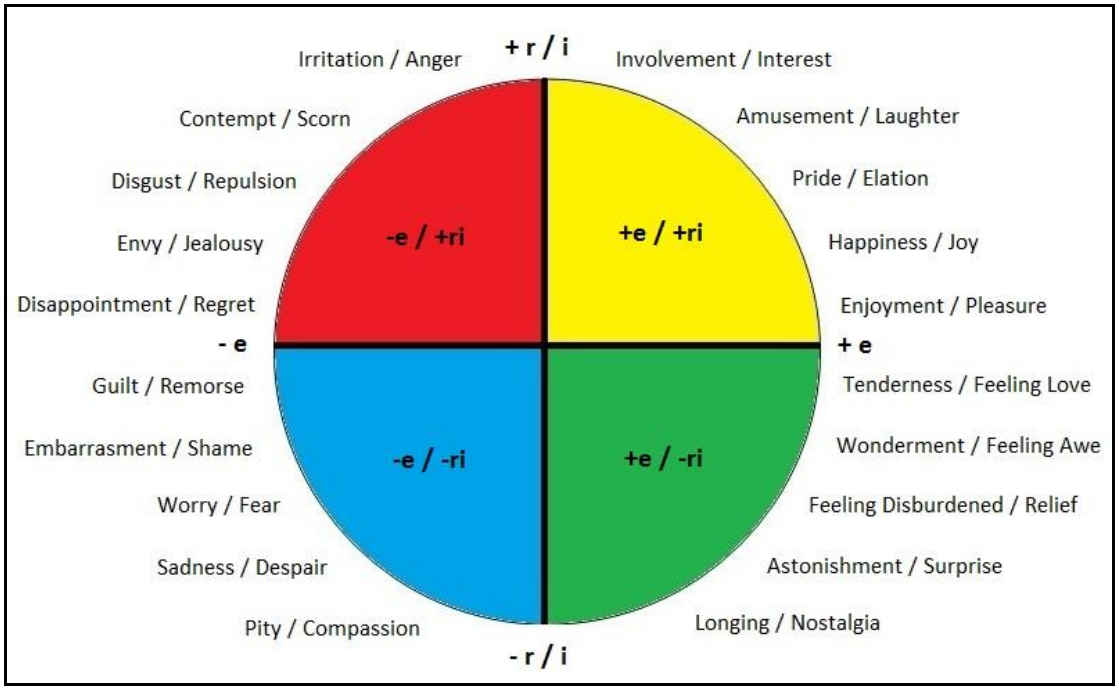


Figure 25 – GEW adapted by this study for use as a 'Four Sound Areas Mix Wheel', categorised by colour and showing all 20 emotion descriptors. Counting clockwise from Involvement / interest (Yellow, 1) to Irritation / anger (Red, 20):

Yellow = descriptors 1 to 5, Green = 6 to 10, Blue = 11 to 15, Red = 16 to 20

8.3 Future work

It would seem that there is ample scope for further research within the field of emotions related directly to the sound design and mixing of soundtracks for moving pictures; particularly in continuing any work that bridges the gap between academic understanding and practitioner methodology. It would also appear to be of value to further the knowledge - and develop a practical understanding - of how sound design practitioners can successful evoke intended emotions within a listening-viewer.

Other questions that stem from this research are:

- Can a 'Universal Law' for emotive moving-picture sound design be established that works for a variety of media; spanning auditioning platforms such as movie theatre, home theatre, television, on-line, hand-held and gaming?

- How important is dialogue delivery and editing to the effectiveness of conveying emotion – how can editing the rhythm and pace of dialogue influence a listening-viewer's emotions?
- What natural, non-human sounds, either as background atmospheres or as foreground spot-effects, elicit clear, repeatable emotional responses?
- How significant is the configuration of the auditioning channel to emotional response; i.e. monophonic, stereophonic or surround sound presentation? Can a Mono soundtrack ever be as emotive as a Dolby Atmos multi-channel soundtrack?
- Does the presentation medium pre-dispose the listening-viewer to respond in a certain way? (e.g. cinema versus home). How close an emotional experience can a home theatre or hand-held device come to that of the carefully designed movie theatre soundtrack?
- Can in-flight movies – contending with the inescapable issue of inherent high background noise – evoke emotions consistent with other auditioning environments and platforms, where subtlety may be difficult to hear in the mix?
- Are a listening-viewer's emotional responses noticeably different between real-life moving-pictures and artificial images? Should certain sound design elements be more exaggerated for animation, given that the audience know that what they are seeing is not real? Do things alter in the ability of sound to evoke audience emotions when using different types of animation: such as stop motion, 2D or 3D animation?
- Could qualitative data be gathered from audiences to include their feedback and comments?

8.5 Closing thoughts

Ingmar Bergman's quote on the front cover of Tarkovsky's autobiography *Sculpting in Time*, described him as 'the most important director of our time'; and both Bergman and Tarkovsky directed their movies with passion, from an *auteur* perspective: their artistic vision is clear to see as the driving force for their films. Both were considered attentive to their soundtracks, Bergman arguably the more so; but over 30 years ago, Tarkovsky, a Russian

émigré film maker exiled in Paris, hinted at the untapped potential within the soundtrack to convey artistic truth, when he wrote:

> […] I have a feeling that there must be other ways of working with sound, ways which would allow one to be more accurate, more true to the inner world which we try to reproduce on screen; not just the author's inner world, but what lies within the world itself, what is essential to it and does not depend on us. (Tarkovsky 1987, p.159)

Yet from experience as a moving-picture sound professional, contributing to content made with a wide range of budgets, size and complexity and with credits for mainstream US productions (e.g. *Lincoln*, *New York I Love You*, *Pirates of the Caribbean*) to more modest UK movies (e.g. *Kingsman: The Golden Circle*, *Finding Fatimah*, *Scott and Sid*) and low budget 'indie' films (e.g. *Mountain Biking: The Untold British Story*, *Last Shop Standing*, *Money Kills*) the author frequently observes that amongst non-sound practitioners working within the film industry, there is less of an acceptance than that shown in academic circles that sound is truly able to enhance the ability of pictures to tell a story.

Instead, it would often seem that sound is considered as the fall-back option for when the pictures don't quite tell the story, or when a scene needs repairing; reinforcing the notion that first comes the picture, then comes the sound: a patronising statement for both sound and vision that does little to move either set of craft skills forward, or develop the medium.

Bresson is clear on the egalitarianism between sound and picture:

> When a sound can replace an image, cut the image or neutralize it. The ear goes more towards the within, the eye towards the outer. (Bresson 1977, p.28)

And yet by speaking out and championing the importance of sound, it inadvertently manages to suggest a continuation of sound's subservient status to pictures, particularly to those who continually choose to not listen. Writer, Producer and Director George Lucas comments on this equipoise:

> I feel that sound is half the experience. Filmmakers should focus on making sure the soundtracks are really the best they can possibly be because in terms of an investment, sound is where you get the most bang for your buck. (Blake 2004)

However, modern and evolving film production methods, contemporary post-production technology, audience taste and consumer hardware mean that an existing outmoded and hierarchical approach towards sound could be reaching an overdue extinction. Sound Editors are now able to work much more collaboratively, and earlier, in the post-production process with picture editors; allowing the sound and picture departments to start work together on the first cut, and then on throughout the subsequent post-production stages.

Indeed, with the introduction of version 15 of their holistic, sound-and-picture post-production application in mid-2018, Black Magic Design's DaVinci Resolve became the first fully integrated sound and picture solution to cover media ingest on location, picture editing, colour correction, visual effects and audio post-production, sharing a common media pool and timeline. In post-production, this enables picture editors, colourists, VFX artists and sound editors to work simultaneously on the same project, without the need to export media, file exchange and re-import, and this kind of collaborative working could point towards a much more efficient way of working. It is, for instance, feasible for the spotting session to take place much earlier in the picture editing workflow (e.g. at the time of the 'rough cut') so that a Picture Editor's presence at the spotting session, alongside the Director and Sound Designer, could deliver a commonality of purpose, at least in terms of intended emotion.

To that end, this kind of flexible workflow could not only be hugely influential in bringing sound and picture departments closer together - and earlier - in creative collaboration; but also the point at which a new sound mixing framework for enhanced emotive sound design within contemporary moving-picture audio production and post-production, could also be timely.

With regard to championing the role of sound in filmmaking, Sound Designer Gary Rydstrom suggests that:

> If we do our jobs well and throw in a little evangelizing, we can

> make sound as important a part of filmmaking as it should be. (Kenny, 2004)

The desire of both the film and television industry to deliver increasingly enhanced aural experiences, and the appetite for this from consumers, is clearly demonstrated by the plethora of audio platforms, equipment and software that is manufactured specifically for the originating of immersive and emotive sound in audio production and post-production; and for the replaying of these increasingly sophisticated soundtracks within film theatres, or on home cinema devices.

For consumers, the choice and understanding of seemingly ever-evolving sound technology can be bewildering. Denison (2017) notes:

> […] sound, for many, remains a confusing technology. Though most understand the concept of using multiple speakers for theatre-like sound, many don't understand the difference between all the different formats. There's 5.1, 6.1, 7.1, 9.2, Pro-Logic IIx, Pro Logic IIz, Dolby DSX and more. It's a lot to wrap your head around. (Denison 2017 at www.digitaltrends.com)

And so as film sound playback technology has evolved towards the immersive experience audiences can now hear in modern theatres, the weight of responsibility for the soundtrack to support visual content through dialogue and music alone has been increasingly shared by other soundtrack elements. Today's rich soundtracks are constituted with very much more than those traditional pillars of dialogue and music; and the purpose of this study is to propose and demonstrate that the Four Sound Areas framework can encourage story-telling to arise more easily and develop more naturally out of the soundtrack.

Meanwhile, multiple Oscar-winning Director Steven Spielberg understands and voices what Sound Designers and Re-recording Mixers passionately feel:

> The eye sees better when the sound is great. (Barsam & Monahan 2009, p.368)

The commitment behind this research by creative practice is an attempt

to serve both the rigours of academic argument and also to provide a useful approach for practitioners of all disciplines engaged with moving picture soundtracks (e.g. picture editors, Directors, as well as sound editors, Sound Designers and Re-recording Mixers), highlighting how and what the creative input from the Sound Designer and Re-recording Mixer can add to an audience's emotional experience of a film, even at the final stage of its production process; and also to help promote a wider understanding that the thoughtful use of sound can bring a greater impact to any moving-picture production, through the often untapped potential that exists connate when filmmakers actually take the time and trouble to consider the conclusion of this study: that audience emotions are more easily accessed by the thoughtful use of emotive sound design, purposefully expounded through the skilful and sympathetic mixing of a Re-recording Mixer.

9 Appendices

Appendix 1

9.1 Release dates of the feature films utilised in this study

‘The Craftsman’ (Dir. L. Murphy) – premiered 10-05-12, Stafford, UK.

‘Here and Now’ (Dir. L. Turner) – premiered 11-03-14, Malmö, Sweden.

Appendix 2

9.2.1 *Here and Now*: other significant sound design details

[01:03:17:03 – 01:07:20:01] Predominantly utilising the *Narrative* and *Abstract* sound areas, the atmosphere tracks layed-in here first establish and then illustrate the contrast between the city (seen from [01:00:20:15] and heard from [01:0048:00 to 01:01:20:00]) and the country – through, at first, prominent morning birdsong, which is then joined by the sound of an outside, distant tractor working the fields as Grace moves through the house, to a burst of nature as Grace steps out of the cottage for the first time (01:04:56:06 to 01:07:20:01). However, the only time we actually see the working machinery hinted at in this sequence is at 01:43:40:20 – 01:43:46:11, when a tractor pulling a trailer across a field can be seen at some distance away.

[01:10:06:00 – 01:10:46:18] Predominantly utilising the *Temporal* sound area, the music track that replaced this temporary version's jolly tune originally cued so that a *glissando* down occurred each time Say rode his bicycle away from Grace, as if she were disappointed by him leaving; however, the author felt that that did not accord with her dismissive attitude towards him, seen immediately before the riding sequence. So the replacement music was re-cued so that each time Grace rode up and alongside Say, she would bring a 'down-beat' mood-change with her, reflected in the music. Say would again ride away, the music would lighten, only for Grace to catch up and the mood of the music to darken once more.

[01:19:17:14 to 01:19:26:15] Predominantly utilising the *Abstract* sound area, the emptiness of the village green, its inherent bleakness supplemented by the sinister squeak of swings moving in the wind, contrasts with Grace sunbathing [01:18:45:04 – 01:19:17:14] to the accompaniment of rather more reassuring birdsong.

[01:58:40:00 to 02:03:28:00] The emotional 'low' - or 'tear-jerker' - point of the film was by design the point at which Poppy breaks down at the party

and tells Lucy that her husband died on the mountain; and that Say has blamed himself for this. This was mixed so that the *Narrative* dialogue is unimpeded by virtue of subtly dropping the level of the *Abstract* crowd sounds in the front speakers during this speech, with an emotively sentimental, guitar-based song entering the timeline at [02:01:57:00] (*Temporal* music and *Narrative* words), whilst we hear and see Poppy crying and being held by Lucy. The author painstakingly edited the originally supplied song to create an extra eight bars of instrumental introduction to better sit the music against the montage pictures (*Temporal* music sitting with the *Abstract* sounds of children playing), ahead of where we eventually see the singer/guitarist in vision. The song also intentionally transitions during this sequence from being non-diegetic to diegetic, the longer instrumental introduction better serving the non-diegetic, reflective purpose of the song.

Appendix 3

9.3.1 Background to the XX Commonwealth Games in Glasgow

Over the 12 days of competition between July 23rd and August 3rd 2014, SVGTV – the joint venture between UK sports producer Sunset and Vine and Australia's Global TV - acted as the Host Broadcaster and provided Rights Holding Broadcasters around the world with over 1,200 hours of live coverage from the 17 sports that made up the twentieth gathering of the Commonwealth Games.

In the UK, the audience for the BBC's relaying of the 2014 Commonwealth Games was estimated to be around 6.8 million viewers per day (BBC 2014); a far cry from the total of 51.9 million people, or 90% of the population, who tuned-in to the 2012 London Olympic games on BBC Television (Plunkett 2014). However, the television audience worldwide for the Glasgow games was a much healthier figure, with an estimated 1 billion viewers spread mainly across the 71 nations of the British Commonwealth (Kellaway 2014).

In contrast to single camera shooting on drama, where one or two boom microphones may be deployed and actors might each wear a personal microphone – a low microphone count – the number of microphones that require mixing together is much higher for sport Outside Broadcasts; employing many microphones in fixed positions relevant to the action.

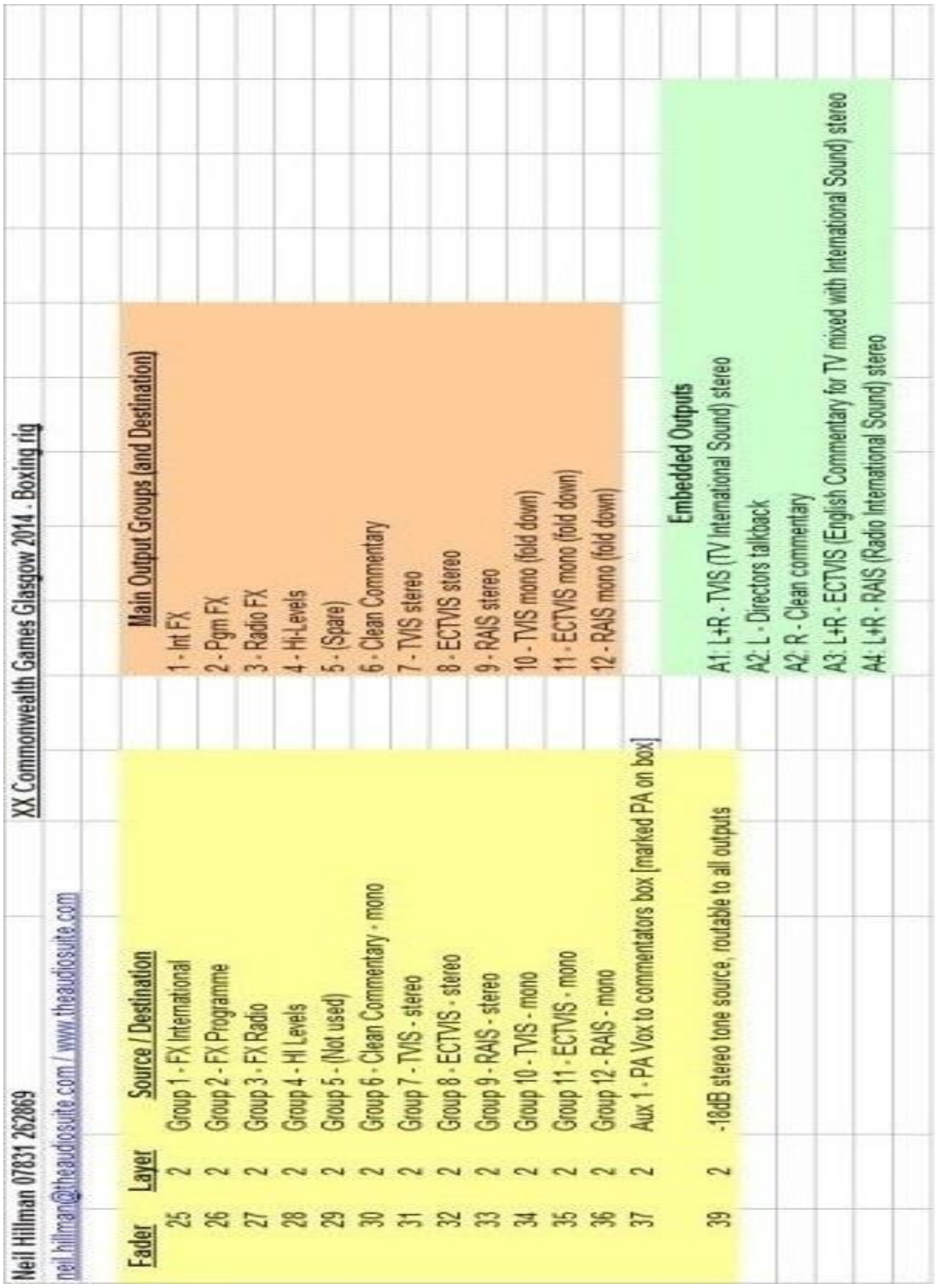
The complexity of capturing and transmitting live O.B. sound from its source is often in stark contrast to the relative simplicity of either recording sound for filmed drama on location, or editing and mixing in a post-production studio. An O.B. can often involve the audio equivalent of carrying-out both the production and post-production stages of a film simultaneously.
The finals for all of the boxing categories, male and female, took place in the Hydro at the SECC precinct. With a capacity of 11,000, this was a substantially larger venue than that of the heats' Hall 4a, which seated a smaller audience of 3,000.

The author was afforded creative freedom by the Production team to achieve the required sound coverage, but within certain unavoidable constraints; e.g. suspended hypercardioid microphones over the ring were ruled out of bounds as they would impinge on the clean overhead shot of the remote-controlled Camera 7; and the desired hypercardioid microphones looking down into the ring, mounted to the lighting truss suspended above the ring, could not be physically attached in time, given the logistics of an overnight de-rig of Gymnastics and the re-rigging for Boxing. Compromise is an important element of microphone placement on Outside Broadcasts.

The audio outputs for transmission purposes were rigidly defined: a full stereo effects mix without Commentary (called ‘International Sound’, designated ‘TVIS’); a full stereo effects mix including Host Broadcaster commentary (called ‘English Language Commentary for Television with International Sound’, designated ‘ECTVIS’); a stereo effects mix for radio without commentary, which was also sent minus any audio that directly related to pictures, such as the feeds from the close-up camera microphones, the microphones placed in the boxer’s corners and the EVS replay machines (called ‘Radio International Sound’, designated ‘RAIS’); and a clean Commentary feed. There were also mono down-mixes of TVIS and RAIS derived within, and sent out from, the mixing desk.

Appendices 6.2 and 6.3 show the desk configuration and layout taken from the heats, which was transferred to the finals as a starting point for configuring the Calrec Apollo mixing console. The initially spare main output group, (Group 5), was used in the finals to control a PA feed to the RAIS circuit, solely for the live bagpiper and recorded music of the medal ceremonies; the PA being a feed that would not otherwise have been included in the RAIS outgoing signal.

9.3.2 Planning sheet 1 for Commonwealth Games Boxing heats / finals



Neil Hillman 07831 262869

XX Commonwealth Games Glasgow 2014 - Boxing rig

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Fader	Layer	Source / Destination
25	2	Group 1 - FX International
26	2	Group 2 - FX Programme
27	2	Group 3 - FX Radio
28	2	Group 4 - HI Levels
29	2	Group 5 - (Not used)
30	2	Group 6 - Clean Commentary - mono
31	2	Group 7 - TVIS - stereo
32	2	Group 8 - ECTVIS - stereo
33	2	Group 9 - RAIS - stereo
34	2	Group 10 - TVIS - mono
35	2	Group 11 - ECTVIS - mono
36	2	Group 12 - RAIS - mono
37	2	Aux 1 - PA Vox to commentators box [marked PA on box]
39	2	-18dB stereo tone source, routable to all outputs

Main Output Groups (and Destination)
1 - Int FX
2 - Pgm FX
3 - Radio FX
4 - HI-Levels
5 - (Spare)
6 - Clean Commentary
7 - TVIS stereo
8 - ECTVIS stereo
9 - RAIS stereo
10 - TVIS mono (fold down)
11 - ECTVIS mono (fold down)
12 - RAIS mono (fold down)

Embedded Outputs
A1: L+R - TVIS (TV International Sound) stereo
A2: L - Directors talkback
A2: R - Clean commentary
A3: L+R - ECTVIS (English Commentary for TV mixed with International Sound) stereo
A4: L+R - RAIS (Radio International Sound) stereo

9.3.3 Planning sheet 2 for Commonwealth Games Boxing heats / finals

Neil Hillman 07831 262869 — XX Commonwealth Games Glasgow 2014 - Boxing rig

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Fader	Layer	Source	VCA group	Group	Output Group
1	1	Crowd (wide) stereo (2 x 416)	1	1, 2, 3,	See sheet 2
2	1	Crowd (centre) MS	1	1,2	
3	1	Ring near - 816	2	1, 2, 3	
4	1	Ring far - 816	2	1, 2, 3	
5	1	Red corner plant - ECM		1, 2	
6	1	Blue corner plant - ECM		1, 2	
8	1	Cam 3 - 416		1, 2	
9	1	Cam 4 - 416		1, 2	
10	1	Cam 5 (RF) - 416		1, 2	
12	1	Commentary		6, 8	
13	1	Crowd Group fader - (VCA 1)			
15	1	Ring FX Group Fader - (VCA 2)			
17	1	Flash Position - RE 50		1, 2	
19	1	PA high level		4	
20	1	PA VOX		4	
22	1	EVS - Red		4	
23	1	EVS - Blue		4	
24	1	EVS - Gold		4	

Main Output Groups (and Destination)

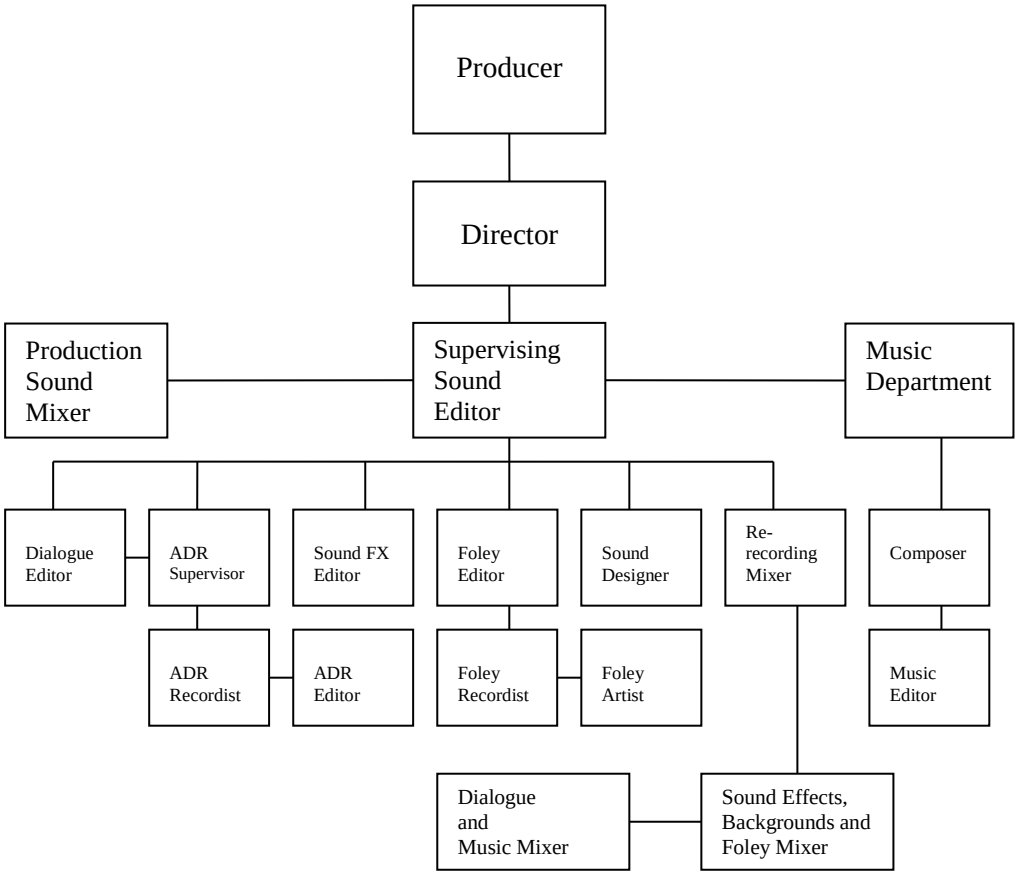
1 - Int FX
2 - Pgm FX
3 - Radio FX
4 - HI-Levels
5 - (Spare)
6 - Clean Commentary
7 - TVIS stereo
8 - ECTVIS stereo
9 - RAIS stereo
10 - TVIS mono (fold down)
11 - ECTVIS mono (fold down)
12 - RAIS mono (fold down)

Embedded Outputs

A1: L+R - TVIS (TV International Sound) stereo
A2: L - Directors talkback
A2: R - Clean commentary
A3: L+R - ECTVIS (English Commentary for TV mixed with International Sound) stereo
A4: L+R - RAIS (Radio International Sound) stereo

Appendix 4

9.4.1 Typical feature film Sound Department hierarchy



Appendix 5

9.5.1 Dates of significant correspondence and conversations

Antonio Damasio:

E-mail -	June 19, 20 / 2011
	July 25, 27 / 2011
	August 03 / 2011

Michael Hedges:

E-mail -	May 8, 11, 14, 15, 22 / 2018
Meeting -	May 7 / 2018 Wellington, New Zealand

Eddy Joseph:

E-mail -	July 22 / 2013
	August 3, 10, 13 / 2013
	September 11 / 2014
Meeting -	July 21 / 2013 Birmingham, UK
	October 26, 27 / 2014 London, UK

Walter Murch:

E-mail -	October 12, 13, 21, 23, 25 / 2011
	November 27 / 2011
	September 04 / 2014
	December 31 / 2014
	April 12 / 2015
	February 07 / 2016
Meeting -	October 20, 21 / 2011 Ghent, Belgium
	April 11 / 2015 London, UK

Gary Rydstrom:

E-mail -	July 6, 22, 24 / 2013
	August 27 / 2013
	September 04, 06, 08 / 2013
	December 31 / 2014
Meeting -	July 05 / 2013 Nottingham, UK

David Sonnenschein:

E-mail -	March 29, 31 / 2013
	April 04, 10, 20 / 2013
	September 06 / 2013
	July 05, 09 / 2017
Meeting -	March 26 / 2013 York, UK
	April 01/ 2013 Stratford, UK
	July 30 / 2017 Banbury, UK

10 Glossary

Abstract Sound – One of Hillman's Four Sound Areas concerned with sounds that have a less codified and clear meaning, such as atmospheres, backgrounds, room tones, sound effects and music.

Actuality Sound – The sound associated with the pictures at the time of filming; e.g. the original location sound.

ADR – Automated Dialogue Replacement; recording replacement speech from actors in time with the original pictures.

Atmospheres – Sounds that work to define the time and place of a location.

Auteur – Derived from the French 'author', it is a term applied to Directors who provide the driving force behind the artistic endeavour and production processes of a feature film, in a similar way to that of an author producing a written work of fiction. Notable names include Alfred Hitchcock, Robert Altman and Federico Fellini, amongst many others.

Backgrounds - Sound effects used in a feature film to help present the time and place of a location; also referred to as atmospheres or 'atmos'.

BBC – British Broadcasting Corporation.

Bed – Underlying composite sounds, often atmospheric in nature

Boom operator – A highly responsible position in the location (production) sound team that requires the accurate positioning of a microphone at the end of a telescopic pole close to actors mouths, without the microphone being seen within the camera frame. Also fits actor's Lavalier-style personal radio-microphones. Can be credited as 1st Assistant Sound.

Bus – A prescribed or assignable path to aid the routing of signals within audio equipment such as mixing desks.

Channel 4 – UK broadcaster funded by commercials.

Channel 5 – UK broadcaster funded by commercials.

Close up (CU) – A picture department term for when a subject's face is tightly framed. Variations include big close up (BCU) and medium close up (MCU). One of the three standard camera framings of Close up (CU), Mid-shot (MS) and Long shot (LS).

Colourist - The person who digitally processes the final image of a project.

Compressed – An audio signal or file in which the amount of data in the recorded waveform is reduced by variable amounts, usually with some loss of quality.

Compressor – A hardware or software device used to lessen the dynamic range between the loudest and quietest parts of an audio signal.

Conform – Re-assembly of the sound elements to match a new version of the picture edit; or the assembly of sound elements from their original sources to match their chosen location in a picture edit.

Cut – Predominantly referring to pictures, it can be a single edit in a scene or refer more generally to a version of picture edit e.g. the ‘rough cut’ versus the ‘fine cut’ or ‘locked cut’.

DAW – Digital Audio Workstation; can be solely software-based, or a combination of software with an external hardware controller.

Deliverables – The specified master materials required by broadcasters and distributors; this usually includes several ‘sub-masters’ such as an M&E track (see ‘M&E’) as well as the master soundtrack for a TV programme or feature film.

Diegetic sound – Sound that originates from a source that can be seen, or is directly connected to the film story. It covers both on and off screen sounds.

Dubbing Mixer – British film and television term for the person responsible for ensuring that the finished film or television soundtrack is correct both technically and stylistically. Also known as a Re-recording Mixer.

EQ – Equalization; the process of adjusting the balance between frequency components within an electronic signal.

Five – UK broadcaster funded by commercials; re-brand of original ‘Channel 5’.

Foldback – A feed of an audio mix sent to a performer, as opposed to the audience.

Foley – Sound effects such as footsteps and clothing rustle recorded in synchronization with edited pictures in post-production. Named after Jack Foley, who was the head of the sound effects department at Universal Studios.

Fps – Frames per second; interval speed of recording / recorded pictures.

Fs – Sampling frequency for digital audio; typically 44.1, 48 or 96kHz

HD – High Definition.

HDTV – High Definition Television.

HPF – High Pass Filter.

Indie – Short for Independent. An independent film is produced outside the major film studio system, being produced and distributed by independent entertainment companies.

ISDN – Integrated Services Digital Network; a standard for the transmission of voice, video and data across the public switched telephone system.

ITV – Independent Television; UK broadcast network funded by commercials.

Layback – The transfer of an audio mix to a master (or sub-master) medium.

LFE – Low Frequency Effects.

Limiter – A compressor with a high ratio, typically greater than 10:1; allows signals below a given power to pass, whilst attenuating those above.

Locked cut – The final version of pictures that will receive no further picture editing, i.e. the pictures are now locked to the sound.
Long shot – picture department term for a camera shot taken from a considerable distance from the action, where people can become indistinct shapes. Variations include extreme long shot and medium long shot. One of the three standard camera framings of Close up (CU), Mid-shot (MS) and Long shot (LS).

LoRo – Left only / Right only refers to a stereo downmix from a 5.1 signal and is also known as an 'ITU Downmix'.

Loudness – The perceived level of an audio signal; governed in the UK and European broadcasting by the EBU R128 standard and in the US by ATSC A/85.

LPF – Low Pass Filter.

LtRt – Left total / Right total; the nomenclature for a stereo signal encoded to Dolby Pro-logic; an encoded matrix of four to six discrete source channels. When decoded with Dolby Pro-Logic, the playback channels are Left, Centre, Right, Surround (L,C,R,S); when decoded with Dolby Pro-Logic II, the playback channels are Left, Centre, Right, Left surround, Right surround, LFE (L,C,R,Ls,Rs,LFE).

LUFS – Loundness Units relative to Full Scale; a measurement standard for loudness in television broadcasting world-wide. See Loudness.

MADI – Multichannel Audio Digital Interface.

M&E – Music and Effects. A standard deliverable for foreign or re-versioned programmes, it contains the music and effects tracks only mixed together (i.e. the full mix minus the original dialogue) and enables the replacing of original dialogue with another language.

Media Pool – The repository for audio and picture media within a non-linear editing system or application.

Mid shot (MS) – Picture department term for a camera shot used to show both actors facial expressions and body language, whilst also allowing a view of the background. Subjects and background equally share the frame. Variations include a single MS, a group MS, a two shot MS and an over-the-shoulder MS. One of the three standard camera framings of Close up (CU), Mid-shot (MS) and Long shot (LS).

Mix Wheel – An adaptation of the Geneva Emotion Wheel utilised in spotting sessions and when planning sound design utilising Hillman's Four Sound Areas framework.

MPSE – Motion Picture Sound Editors; US-based honorary organization.

Mute – Switch used to silence the output of a signal path.

Narrative Sound – one of Hillman's Four Sound Areas concerned with sound that carries direct communication and meaning. Examples include dialogue and commentary as well as symbolic and signaling sounds such as ring-tones and sirens; it also includes music with a clearly defined meaning.

Non-diegetic sound – Sound whose source is not seen on-screen, nor meant to be thought of as sound connected to the on-screen action. (The opposite to Diagetic sound.)

Octave – A doubling in frequency.

PA – Public Address; the loudspeaker feed to the audience.

Peak – A signal's maximum output level.

Peaking – A signal reaching maximum output level.

PFL – Pre-Fade Listen; a monitoring facility allowing a signal to be monitored without fading it up in a mix.

Plug-in – A software accessory that sits within a DAW operating system, but provides its own user-interface. Used to analyse, transform or generate new audio samples.

PPM – Peak Programme Meter; standard broadcast level measurement tool.

Pre-Mix – The mixing of some or all of the edited sound elements (e.g. dialogue, music or sound effects) ahead of the final mix, so that the final mix is accomplished quicker and more easily.

Production Mixer – The person responsible for recording the sound on location; Head of the location Sound Department, assisted by 1 or 2 boom

operators (credited as 1st assistant sound) and a more junior assistant (credited as 2nd assistant sound).

Production sound – The sound recorded on location by the Production Mixer.

QC – Quality Control.

Reel – Although originally referring to 16mm or 35mm film, modern non-linear post-production still breaks down a feature into segments of a roughly equivalent time to a 35mm reel (approximately 20 minutes). A standard length feature film is known as a 'five-reeler'.

Re-recording Mixer – The person responsible for ensuring that the finished film or television soundtrack is correct both technically and stylistically. An alternative term for the British title of Dubbing Mixer.

RMS – Shortened term for Root Mean Square. An audio RMS meter can be used as an approximation of the way the human ear perceives sound levels; as ears do not typically perceive sharp peaks to be as loud as they actually are.

Rough cut – The point in the picture editing process where the film first starts to resemble its intended layout. The changes resulting from observing the rough cut lead towards several further refining picture edits (known as 'fine cuts') before the final version of the pictures is arrived at (known as the 'locked cut').

RX – Shortened term for Rehearse, Record, Receive or Receiver.

Score – The music used within a film. Often wrongly described as 'the soundtrack', which is only used to describe the music used in a film when it is commercially released to the public e.g. as a 'soundtrack album'.

Scratch mix – A fast mix of early work-in-progress material for investors or distributors to view. The audio equivalent of the picture 'rough cut'.

SD – Standard Definition.

Solo – The ability to isolate a signal within an audio mix.

Sound Designer – The person responsible for the overall style of the sound of a film. In some cases, the Sound Designer will supervise both the sound editing and re-recording stages of audio post-production. Sometimes included in credits simply as the Supervising Sound Editor.

Sound Supervisor – Most usually used in the television industry to denote the person mixing the sound and in overall charge of a programme's audio output.

Soundtrack – The full audio mix of a feature film.

Source music – Music heard by the on-screen characters; see *Diegetic sound.*

Spatial Sound – One of Hillman's Four Sound Areas concerned with the positioning of sounds within a three dimensional soundfield and the space placed around the presented sound.

Spotting – A 'session' where the Sound Designer or Supervising Sound Editor compiles a list of the sound effects or music required, scene by scene, throughout a film; also used as a time for reviewing a film with the Director to determine or explain what work will be required on the soundtrack.

Stems – The component parts of a mix, usually comprising separately of dialogue, music and sound effects that when combined make up the full final mix of a film or television programme.

Sub – Subwoofer; speaker dedicated to low frequency signals.

Supervising Sound Editor – The person in charge of the sound editorial process, including dialogue, Foley and sound effects editing. Can sometimes be used as an alternative term for Sound Designer.

Tableau Vivant – A theatrical term referring to actors posing silently to represent a scene, painting or sculpture. Literally, 'a living picture'.

Technical Review – The Quality Control process undertaken for every broadcast television programme.

Temp Mix – A quick mix made during the audio post-production process to help determine how things are working together in the soundtrack.

Temp Music – Music used as a placeholder in the soundtrack whilst the final choice of music is selected or written.

Temporal Sound – One of Hillman's Four Sound Areas concerned with the evolution in time of the sound design. Its characteristics are rhythm, pace and punctuation. This area can include music, sound effects and voice.

Timeline – The visual display of edited sequences on a non-linear editing system, arranged in chronological order.

Track laying – The term used to describe the creation, selection and positioning of audio by the Sound Editor / Sound Designer on a DAW, in advance of delivery to the mixing stage.

Two-shot – A framing of the camera to include two featured actors.

TX - Shortened term for Transmission, Transmit or Transmitter.

Uncompressed – The most accurate digital representation of a sound wave, as epitomised by the Wave, Broadcast Wave, AIFF and mxf file formats.

UHD – Ultra High Definition (in picture terms, sometimes incorrectly referred to as ‘4K’) although often advertised as one-and-the-same, at 4,096 by 2,160 (an aspect ratio of 1.9:1) cinema 4K resolution is greater than that used for Ultra High Definition (UHD) television at 3,840 by 2,160 (a smaller aspect ratio of 1.78:1)

VFX – Shortened term for visual effects

VT – Originally Video Tape or Video tape machine; but still used as a term for the playing in of pre-recorded pictures (e.g. title sequences) from solid-state hardware or software devices in a live environment. Still colloquially expressed by Directors calling “Roll VT” on live television productions.

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