Stansbie, Adam (2013). The Acousmatic Musical Performance: An Ontological Investigation. (Unpublished Doctoral thesis, City University London)

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The Acousmatic Musical Performance

An Ontological Investigation

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March 2013

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List of Compositions

Isthmus (3 Movements)	2005	10'05"	CD 1, Tracks 1, 2 and 3
Early Morning	2006	11'24"	CD 1, Track 4
Parenthesis	2008	8'54"	CD 1, Track 5
Point of Departure	2009	22'04"	CD 1, Track 6
Escapade	2010	9'44"	CD 1, Track 7
Fractions (Stereo)	2011	9'10"	CD 2, Folder 1
Fractions (7.0)	2011	9'10"	CD 2, Folder 2

Declaration

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Adam Stansbie, 1st March 2013

Abstract

This investigation provides an answer to the following ontological question: *what is an acousmatic musical performance*? Chapter 1 discusses acousmatic sound – a fundamental constituent of the acousmatic musical performance – and considers ways in which acousmatic sounds are determined in advance of, and during, a performance. Chapter 2 presents the acousmatic performance as an agent-centred, skilful enterprise that serves both composers and listeners through intentional communicative acts. Chapter 3 examines the nature of, and relations that hold between, acousmatic performances and acousmatic works. Chapter 4 considers interpretations *of* works and highlights some of the various ways in which interpretations are formulated, regulated and executed. Chapter 5 focuses upon the notion of performance authenticity and questions whether it is possible for an acousmatic performance to be considered inauthentic. Taken as a whole, these five chapters highlight the central constituents of the acousmatic musical performance, unravel the collective input of composers, performers, listeners and technologies, and explicate the complex network of relations that coalesce within the performance environment.

The methods employed within this thesis relate to the practice of musical ontology, and have been significantly influenced by Richard Wollheim's realist account of *type* and *tokens* (Wollheim 1980) and Stephen Davies' notion of *thick* and *thin* musical works (Davies 2004). These ontological theories provided a method for identifying and discussing the relations that hold between acousmatic performances and acousmatic works, and were ultimately fundamental to the formulation of a bespoke type-theory that serves music of the acousmatic tradition. Accordingly, the research serves two distinct communities. On the one hand, it serves the ontological community; acousmatic music has received very little ontological attention and, as a result, this research broadens the investigative scope of the discipline whilst considering how existing theories may be applied to music of the acousmatic tradition. On the other hand, it serves the acousmatic community; by abstracting and explaining the central constituents of the acousmatic musical performance, this investigation clarifies the roles of composers, performers and listeners, and demonstrates how understanding of these roles may inform creative practice.

A portfolio consisting of six original acousmatic compositions has been produced. This compositional research allowed theoretical ideas to be tested, and works in the portfolio are cited to contextualise key points.

Introduction

What is an acousmatic[1] musical performance? How do such performances come into being, survive and cease to exist? What are the central constituents of an acousmatic performance? Are performance constituents brought about by acts of human agency, or technological wizardry? Are acousmatic performance constituents predicated upon any specific skills? If so, are these skills regulated by communities, guilds and/or performance traditions? Do acousmatic performances instantiate acousmatic works? If so, how can one explain and characterise the relations that hold between performances and works? Is it possible to *interpret* acousmatic works through the act of performance? Are there any limitations that regulate interpretations of works? If so, where do these limitations come from? Are some acousmatic performances more (or less) authentic than others? If so, what does the term *authenticity* mean, and is performance authenticity actually important to acousmatic composers, performers and listeners?

This investigation provides answers to the above questions. In doing so, it offers an ontological[2] account of the acousmatic musical performance that explicates the many interwoven factors that coalesce within the performance environment whilst surveying the complex network of relations among them. The backbone of this idealised account can be summarised in a single sentence:

[1] The term *acousmatic* refers to the Akousmatikoi – a group of Pythagorean students dedicated to the religious and ritualistic aspects of Pythagorean teaching (Scruton 1999, p.2). Legend has it that Pythagoras conducted some of his teaching from behind a curtain in order that the akousmatikoi could concentrate their attention upon the sound of his voice (Scruton 1999, p.2); Jérôme Peignot clearly had this in mind when, in 1955, he used the phrase *bruit acousmatique* to describe the dislocation of a recorded sound from its source, as encountered in musique concrète (Emmerson and Smalley 2001). Peignot's phrase was subsequently taken up by Pierre Schaeffer, the founder of musique concrète, who likened the tape recorder to the Pythagorean curtain (Emmerson and Smalley 2001). In recent years, the term acousmatic has been used to describe a listening situation in which the source or cause of a sound is not presented (visually) to a listener. When used in this context, the term acousmatic suggests an aesthetic stance in which an acousmatic listening situation is essential to both the presentation and the reception of music (Harrison 1999a, p.1).

[2] Ontology is a branch of metaphysical philosophy that is concerned with the nature of being or existence. It is often described as the theory of objects and their ties, providing criteria for distinguishing different types or kinds of objects, enabling one to unpick the various relations that such objects enter into (Hofweber 2012, p.1). The various methods employed by ontologists, including those employed within the current thesis, are discussed in the following section (Methodology).

the acousmatic musical performance involves *sounds* that are produced and regulated by human and technological *agents* to instantiate acousmatic *works* through an act of *interpretation* that is intentionally and necessarily *authentic*. Taken as a whole, *sounds, agents, works, interpretations* and *authenticities* underpin the diverse, multifaceted and heterogeneous nature of the acousmatic musical performance.

This ontological investigation does not merely identify the central components of the acousmatic musical performance. It also considers the various factors that constrain, regulate and determine the nature and/or character of such components. Accordingly, the acousmatic performance is described as an agent-centred, skilful enterprise that serves both listeners and composers through specific and intentional communicative acts. These acts are regulated by performance traditions and performance communities, and typically serve to instantiate specific works that are imbued with various contextual and stylistic prescriptions and constraints. By abstracting and dissecting individual performance constituents, this investigation unravels and explains the collective input of composers, performers, listeners, technologies and contextual contingencies, as revealed (albeit obliquely) within the acousmatic musical performance.

A significant portion of the investigation is concerned with the various ontological relations that hold between acousmatic performances and acousmatic works. There are three main reasons for this. Firstly, the performance/work relationship has been overlooked, marginalised and misrepresented within the existing literature[3]. Secondly, an understanding of the performance/work relationship provides a theoretical platform upon which a discussion of performance *interpretation* and performance *authenticity* may be built. Thirdly, a detailed understanding of acousmatic works enables one to untangle certain fundamental misconceptions that acousmatic performance practice appears to raise. Thus, whilst this thesis is primarily concerned with the acousmatic musical performance, it is also concerned with the ontological nature of the acousmatic work.

[3] The 'three main reasons' listed in this section are explained and justified in the following section (Methodology) and further developed later on (Chapter 3).

Before considering the methods employed within this thesis, we shall briefly consider some of the intended recipients and beneficiaries of the research, starting with acousmatic performers, before considering acousmatic listeners and composers. An additional recipient is considered in the following section[4].

The research presented within this thesis is beneficial to acousmatic musical performers. However, it does not attempt to illuminate best practice, and is neither a performance manual. Instead, this research, which is largely descriptive rather than prescriptive, offers acousmatic performers a normative template against which their performative ideals may be considered, explained and discussed. Although substantial parts of this investigation are idealised, the various terms and concepts may be applied in a wide variety of performance situations and this enables performers to conceptualise and articulate aspects of their practice away from the performative event. The acousmatic performer may be particularly interested in the discussion of regulatory factors; performance communities, compositional trends, technological innovations and audience-related intentions unite to inform and regulate performance practice, and an awareness of their collective influence enables the performer to understand how their actions are informed by (and subsequently inform) the acts of other agents.

This research is equally beneficial to listeners who are, as a result of the acousmatic listening situation, often denied (visual) access to the actions and gestures of acousmatic performers. By explicating the various factors involved in the performance of acousmatic music, this investigation enables listeners to make a conceptual distinction between performance and works, recognise some of the various performance-related challenges that the performer must overcome, and understand the role and function of a listening public relative to a given performance. It is worth noting that the ideas presented in this thesis do not seek to deliver evaluative judgements in relation to specific performances, pieces or musical traditions. However, this investigation does provide a theoretical background against which judgements may be presented and defended.

[4] This investigation employs a number of methods and techniques common to the practice of musical ontology. As a result, the ideas presented in this thesis also serve the ontological community. This point is introduced and explained in the following section (Methodology).

In addition to performers and listeners, the research serves the acousmatic composer. Performances are often considered during the act of composition and, as a result, such acts have a performance-*telos*[5]. Accordingly, a detailed understanding of the complex network of relations that combine within the performance environment can inform, shape and even underpin certain compositional decisions. To demonstrate this point, a portfolio of six original acousmatic compositions is presented and the associated compositional intentions and motivations are introduced and explained. These compositions serve to contextualise many of the ideas discussed throughout the thesis, suggest ways in which an understanding of the acousmatic musical performance may inform the creative process, and present a compositional rationale that situates performance at the heart of the aesthetic.

Methodology and Rationale

The various questions listed in the introduction relate to the practice of musical ontology. This section briefly introduces such a practice, surveys some of the central objectives of a musical ontology, considers how these objectives relate to the thesis and provides a rationale for the investigation[6].

At the start of *Musical Works and Performances: a philosophical exploration,* Stephen Davies, a well-known musical philosopher, outlines a series of ontological questions that are relevant to his practice; these include:

> What is a musical work? Are musical works of a single kind? Are free improvisations best regarded as performances of ephemeral works? Can two composers working independently create the same, single piece? Do composers discover or create their compositions? Of what elements are musical works comprised? Is there more to a piece than its sound sequence? How are works specified by notations? Is everything recorded in the score work-identifying and, hence, required in an accurate performance? What conditions must be satisfied if a

[5] The Greek term *telos* refers to an end, purpose or ultimate goal. It forms the root of the term *teleology* which is the study of ends, purposes or goals.

[6] The various ontological methods discussed in this section are further developed and explained throughout the thesis. This section merely serves to introduce and explain the broad interests and concerns that underpin the practice of musical ontology.

> performance is to be of a particular piece? Can performances that sound different faithfully represent and be of a single work? Can performances that sound the same faithfully represent and be of different pieces? Can a performance simultaneously be of more than one work?
>
> (Davies 2004, p.4)

Taken as a whole, these various questions are representative of the broad and heterogeneous discipline known as *musical ontology*. In some cases, musical ontologists seek to answer a single question, such as: 'How are works specified by notations?'. In other cases, ontologists seek to answer a whole series of questions, such as those listed above. Both approaches are equally valid.

Answers to ontological questions are frequently diverse. For example, the question 'What is a musical work?' has provoked a wide variety of different answers; some ontologists have suggested that musical works are imaginary entities (Collinwood 1958; Croce 1952); others have rejected this view, arguing that works are simply groups, classes or sets of performances (Goodman 1969; Predelli 1995; 1999). An alternative view postulates that musical works are universals (Kivy 1983; Price 1982; Wolterstorff 1980); others claims that they are types of sound structures (Davies 2004; Wollheim 1980), or types of performances (Kania 2005), and so on[7]. This diversity, which is characteristic of many ontological investigations, arises, at least in part, because the practice of musical ontology involves: "[...] the painstaking process of arguing about fundamental questions, without the benefit of any prearranged or systematic answer to them" (Scruton 1999, viii). Scruton goes on to note that ontologists proceed by presenting a bespoke hypothesis that is explained and justified using logical arguments, thought-experiments, claims and counter-claims that are always ripe for further debate.

The investigation undertaken in this thesis contributes to the on-going ontological debate. However, it focuses upon acousmatic music and is therefore concerned with an artistic tradition that has received very little ontological attention; most ontologists of music are primary concerned with scored,

[7] The various terms introduced in this paragraph serve to highlight the diverse range of possible answers to a seemingly straightforward question. The terms are explained in Chapter 3.

instrumental works of the Western classical tradition[8] and references to acousmatic music, which are largely infrequent and brief, are typically consigned to the margins, footnotes and/or endnotes of their investigations. Despite this, these brief references are sufficiently numerous to reveal the following view: acousmatic performances do not exist, since the music is simply *played back* (Davies 2004; Godlovitch 1998; Ferguson 1983; Levinson 2006; Kania 2005; Urmson 1976; Wolterstorff 1980).

The above view is as understandable as it is regrettable; ontologists, who have a specialised knowledge of ontological methods, terms and techniques, can only theorise about those traditions that they know particularly well, but most appear to have a limited understanding of the acousmatic tradition. The vast majority of musical ontologists seem unaware of the compositional methods employed in the creation of acousmatic music and none of the various theorists listed above have considered or discussed the practice of sound diffusion and the various issues surrounding the presentation and instantiation of acousmatic works. As a result, the discussion of *playbacks* often results from a lack of specialist knowledge.

The situation outlined above is often reversed when acousmatic composers and theorists engage in the practice of ontology; whilst they may have a detailed knowledge of the acousmatic tradition, acousmatic composers and theorists often have a limited understanding of the methods and techniques employed by musical ontologists. This does not (and should not) prevent acousmatic composers from posing ontological questions, but it does limit their ability to provide rigorous and structured answers. This point has been raised by Jonty Harrison, who, in a recent talk, considered the ontological nature of acousmatic musical works:

> There is debate, even among composers of acousmatic music, as to what constitutes 'the work' – is it the trace on the storage medium (let's call it the 'studio version') which, when

[8] Stephen Davies has recently considered the ontology of folk, jazz, popular music, electronic music and various non-Western musical traditions of the Middle East and of Japan, China, India and Indonesia (Davies 2004), Andrew Kania, has considered the ontology of rock music and jazz (Kania 2005; 2008) and Theodore Gracyk has discussed the ontology of popular (recorded) music (Gracyk 1997). Despite this, the vast majority of musical ontology is concerned with canons of the Western classical tradition.

> reproduced in conditions sufficiently similar to those of its composition, renders the piece audible as the composer heard it? Or is it the public presentation, probably on a larger sound system, in an unknown acoustic, in which case what is stored on tape/disk is 'incomplete', serving merely as the blueprint for further manipulation of the sounding material? Can it be both?
>
> (Harrison 2011, p.5)

In this short statement, Harrison poses a number of ontological questions. However, he does not attempt to provide any answers to these questions, stating that this is not his primary objective:

> [...] I am raising questions for discussion, rather than offering answers or definitions [...]. What I hope to do is simply identify some of the areas in which further investigation is required.
>
> (Harrison 2011, p.1)

This investigation addresses some of these ontological areas and provides answers to Harrison's questions. In many respects, this involves the assimilation and synthesis of two distinct bodies of knowledge. On the one hand, it draws from the vast body of ontological literature, including (amongst others) the writings of Stephen Davies (2004), Lydia Goehr (2007), Nelson Goodman (1969), Roman Ingarden (1986), Andrew Kania (2005; 2008), Peter Kivy (1983; 1991; 1997), Roger Scruton (1994; 1999; 2004) and Richard Wollheim (1980). On the other hand, this investigation draws from the writings of acousmatic composers, performers and theorists, such as John Dack (2001; 2002), Simon Emmerson (2006; 2007a; 2007b), Jonty Harrison (1988; 1999a; 1999b; 2000; 2010; 2011) Denis Smalley (1986; 1991; 1996; 1997; 2007). Whilst this list of authors implies a substantial literature review, the assimilation and synthesis of ideas presented within this thesis serves to reveal significant gaps in existing knowledge. The proposed investigation fills such gaps, providing a bespoke ontological account of both acousmatic music and the acousmatic musical performance.

Accordingly, this thesis intentionally serves two distinct communities. On the one hand, it serves the ontological community, broadening the investigative scope of the discipline through the consideration of a musical tradition that has, thus far, received very little attention. On the other hand, the

ideas presented in this thesis serve the acousmatic community, outlining the central constituents of the acousmatic musical performance, considering some of the various relations among them whilst providing a detailed account of the performance/work relations that typically underpin creative practice[9].

Overview

As stated in the previous section, the acousmatic musical performance involves: *sounds* that are affected by both human and technological *agents* to instantiate acousmatic *works* using acts of *interpretation* which are invariably characterised by varying degrees of *authenticity*. These italicised terms provide the titles for the five chapters in this thesis[10]. Accordingly, each constituent of the acousmatic musical performance is considered individually to provide a detailed account of the acousmatic performance whilst considering some of the various relations that bind these constituents. Taken as a whole, these chapters present an idealised view of the acousmatic musical performance that endeavours to be broad, inclusive and comprehensive. Chapter 4 considers how a detailed understanding of the acousmatic musical performance may inform and direct the compositional process. The portfolio of six original acousmatic compositions is discussed in relation to the ideas presented elsewhere and the ensuing discussion demonstrates how these ideas developed throughout the course of the investigation. We shall briefly consider each individual chapter in more detail.

Chapter 1 introduces acousmatic *sounds* and develops the following point: sounds are fundamental constituents of the acousmatic musical performance. The discussion is divided into three broad sections. The first

[9] The desire to serve two distinct communities has one major disadvantage – some of the ideas presented serve to introduce topics that are extremely familiar to the acousmatic community but probably less familiar to the ontological community (as per Chapters 1 and 2) and vice versa (as per Chapters 3, 4 and 5). It is hoped that Chapters 1 and 2, which cover extremely familiar ground, will be understood in the context of the broader thesis aims. A range of complex and unfamiliar ideas is presented from Chapter 3 onwards.

[10] The titles of the first three chapters are derived from Stan Godlovitch's *Model of Musical Performance* - an idealised view of musical performance that refers to *sounds*, *agents*, *works* and *listeners* (Godlovitch 1998, pp.11-51). There are no further similarities between the ideas presented in this thesis and the ideas presented in Godlovitch's model, because he refuses to discuss acousmatic music in relation to his model, claiming that acousmatic performances do not exist. Most of Godlovitch's various arguments are introduced, discussed and dismissed within the first two chapters of this investigation.

section suggests that acousmatic sounds derive from a compositional process; acousmatic composers work directly with recorded and synthesised sounds and thus produce music that is characterised by an unprecedented degree of specificity. The second section, which functions as a literature review, discusses the views of four ontological theorists who believe that it is not possible to *perform* acousmatic sounds on the grounds that they are *fixed* during the compositional process (Davies 2004; Ferguson 1983; Godlovitch 1998; Kania 2005). The third section rejects such a view; acousmatic sounds may be *largely* predetermined during the act of composition but they are further shaped, developed and modified during the act of performance and are, as a result, certainly not fixed.

Chapter 2 discusses performance *agency.* It starts by suggesting that the acousmatic musical performance involves a human agent, known as a *performer* or *sound diffuser,* before considering some of the various performance systems that the human agent may use. The chapter goes on to discuss some of the diverse and multifaceted agential acts that are commonly employed during a performance, identifies a distinction that holds between *corrective* and *expressive* agential acts and differentiates between stereo, multichannel and stem-based sound diffusion. The chapter concludes with a discussion of agential skills (including memory, timing, dexterous and aural skills) and intentions (relative to the music that is being performed, the agential acts that are employed and the listening public). The acousmatic performance is a skilful, agent-centred enterprise that serves both composers and listeners.

Chapter 3 develops a work-*concept* in order to demonstrate the following point: acousmatic performances instantiate acousmatic works. It starts by differentiating between performances and works, drawing upon the ontological writings of Roman Ingarden (1986), Guy Rohrbaugh (2005) and Andrew Kania (2005; 2008). The chapter goes on to provide an ontological account of the acousmatic work, surveying three dominant ontological views (the *medium* view (Ferguson 1983), the *class* view (Goehr 2007; Goodman 1969) and the *type* view (Davies 2004; Wollheim 1980)). In each case, the relevant ontological view is introduced, explained and critiqued, before being discussed in relation to the acousmatic work. The chapter concludes with a

discussion of the various relations that hold between acousmatic performances and works.

Chapter 4 focuses upon the notion of performance *interpretation.* It starts by highlighting the *need* to interpret acousmatic works, before suggesting that interpretations of works are informed by, and respond to, sonic behaviours, references and their associated structural functions. The discussion draws upon the six original acousmatic compositions included in the associated portfolio, before considering some of the various additional factors that shape the interpretative act. It suggests that interpretations must be formulated in response to the work, the listening space, the diffusion system and numerous context-specific constraints that *may* be encountered during the act of performance. The chapter concludes with a discussion of interpretative skills.

Chapter 5 considers the notion of performance *authenticity.* It starts by suggesting that composers, performers and listeners place a certain *value* on performance authenticity before suggesting that authenticity is ontological necessity rather than an interpretative option. The following two sections consider whether performances must be considered authentic/inauthentic in relation to the composer's performance-related intentions or their works.

The appendices serve to further develop a range of points introduced in the five chapters. **Appendix III** is of particular interest, since it focuses upon the musical works included in the associated portfolio of original acousmatic compositions, contextualises the various ideas presented elsewhere, and highlights some of the ways in which these ideas have developed. The ensuing discussion demonstrates how a detailed understanding of the ontology of the acousmatic musical performance may inform, and even direct, the compositional process. The six compositions present various different aspects of a broad aesthetic approach that foregrounds the performative aspects of the creative process.

Chapter 1: Sounds

This chapter is divided into three sections. The first section considers the compositional process(es) involved in the creation of acousmatic music (Section 1.1), noting that acousmatic composers work directly with recorded sounds and, as a result, produce music that is characterised by an unprecedented degree of specificity. The second section surveys some of the existing ontological literature and considers the views of Stephen Davies (2004), Linda Ferguson (1983), Stan Godlovitch (1998) and Andrew Kania (2005) (Section 1.2) – these ontologists believe that is it not possible to *perform* acousmatic sounds on the grounds that they are *fixed* during the composition process. The third section rejects this view (Section 1.3); acousmatic sounds may be *largely* predetermined. However, they are often shaped and modified during the act of performance and are, as a result, certainly not *fixed*. Taken as a whole, the three sections within this chapter serve to introduce both acousmatic music (albeit in skeletal form, to presuppose further discussion, or fleshing out, in subsequent sections and chapters) and some of the various ontological views that this thesis seeks to oppose. At the end of the chapter, the following conclusion is presented and defended: sounds are fundamental constituents of the acousmatic musical performance[11].

1.1 The Compositional Process

The various sounds that are encountered in an acousmatic musical performance will have been largely predetermined. This is because acousmatic composers work directly with sounds during the compositional process. The typically begins when a composer records a sound or a set of sounds[12]. Recording, itself a

[11] This chapter, which functions as a literature review, does not identify the specific types of sounds that one is likely to find in an acousmatic work. Such sounds are discussed in Section 4.1, and specific examples are aligned with the portfolio of original acousmatic compositions. The ideas presented in Section 1.1 will be familiar to most acousmatic composers and theorists and are primary directed towards ontological theorists, who may be less familiar with the acousmatic tradition.

[12] Composers may also synthesise sounds, using a process described by Emmerson and Smalley: "Creating a sound through synthesis requires the composer to design the constituents of a sound

process, involves the conversion of acoustical sound energy into static, encoded audio (Mooney 2005, p.18). Historically, composers used analogue recording technologies which converted variations in sound pressure into variations in electrical voltage which was, in turn, converted into a varying pattern of magnetisation on a tape or a groove of varying deviation on a vinyl disc (Rumsey and McCormick 2006, p.193). More recently, composers have used digital recording technologies, which convert variations in sound pressure into a series of binary numbers which are then stored in a coded form representing the amplitude of the signal at a unique point in time (Rumsey and McCormick 2006, p.193). In this context, the term *encoding* may refer to either the conversion process or to the coded representation resulting from such a process.

The recording process, as encountered within acousmatic composition, may be lengthy and involved. The acousmatic composer must select something (a sound source) to record and, following this, must decide how to record the chosen source. In some cases, the composer will be able to explore a source by exciting it in numerous different ways to produce a varied range of sounds whilst employing various different recording techniques to reveal, magnify and capture subtle details and nuances as they emerge (Emmerson and Smalley 2001, p.1). In other cases, composers will have little control over the source that they have chosen; although: "sounds that were previously ephemeral can be captured, and environmental phenomena can be imported into music" (Emmerson and Smalley 2001, p.1), these sounds are often difficult to record since the composer is not necessarily able to control the processes and events that give rise to such phenomena.

Once captured, recorded sounds will be auditioned and assessed by the composer. This typically involves a process of decoding audio; the encoded audio is converted back into a continuously varying voltage which is, in turn, converted into physical movements within some kind of medium, the resulting vibrations subsequently causing sound waves which are amplified and presented over loudspeakers (Mooney 2005, p.21). By decoding recorded sounds, the

and their evolution according to a particular method – for example, building sounds based on waveforms, constructing sounds out of the briefest sound-grains, or specifying the parameters of models based on the behaviour of the voice, instruments and other sounding bodies." (Emmerson and Smalley 2001, p.1)

acousmatic composer is able to make compositional decisions on the basis of audibly verifiable criteria:

> The assessment of material and processes is made through the perceptual response of the composer as 'first listener', in a process based on actual (concrete) aural experience, and using the ear/brain mechanism most immediately to hand (the composer's) as representative of the (presumably similar, though not identical) mechanisms of other human beings.
>
> (Harrison 1999a, p.118)

In this respect, acousmatic music shares the methods, techniques and concerns of musique concrète (Harrison 1999a, p.1). Pierre Schaeffer introduced the term *musique concrète* to describe a compositional method in which composers engage directly with recorded sound materials (Harrison 1999a, p.2). Schaeffer sought to differentiate this method from that of the instrumental composer who does not work directly, or concretely, with sounds but indirectly, with abstract notational systems (Emmerson and Smalley 2001; Dack 2002; Schaeffer 1966)[13]. Thus, acousmatic composers are, like their musique concrète counterparts: "dealing with the "stuff" or "matter" directly presented" (Dack 2002, p.4).

The acousmatic composer may, as a result of an aural assessment, choose to use recorded sounds without any further modification or transformation. However, it is likely that the composer will, at the very least, edit these sounds, or, as is often the case, transform or manipulate them during the compositional process. In many cases, acousmatic composers employ digital sound processing tools and computer programmes to facilitate the manipulation of sounds. These may be used to craft, shape and sculpt pre-recorded (or synthesised) in ways that are, according to Trevor Wishart: "[...] limited only by the imagination of the composer" (Wishart 1994, p.1)

Sound processing tools directly affect the recorded, encoded audio. However, they typically afford a degree of direct, hands-on control that has

[13] Schaeffer's use of the term *concrète* served to emphasis the difference between his compositional techniques and a perceived over-formalisation of abstract serial techniques employed by many of his contemporaries. John Dack provides a comprehensive overview of the various differences, noting that the specific meaning is often unclear since the term concrete can be used as both an adjective and a noun (Dack 2002).

striking parallels with direct manipulation of physical materials common to the various plastic arts such as painting and sculpture. Some acousmatic composers support this view, often referring to the haptic, kinaesthetic and even proprioceptive nature of their compositional processes (Nance 2007, p.13) and one may find numerous cases where acousmatic composition has been discussed alongside the plastic arts (Ferguson 1983; Schaeffer 1952; Urmson 1976)[14]. By contrast, Jonty Harrison suggests that the manipulation and processing of sound materials is, in many ways, similar to the physical acts and gestures that are typically associated with musical performance:

> The manipulation of sound materials was, historically, a physical, manual process - it was, in other words, "performing" in the studio. Even though this is now often done *via* digital surrogates, our aural understanding of the essential "physicality" of performance gestures in shaping musical utterance remains intact. Thus we can assert that elements which we would readily associate with performance were and remain embedded in the *composition* of *musique concrète* and its descendants.
>
> (Harrison 1999a, p.4)

The acousmatic composer may spend a considerable length of time manipulating and transforming sound materials before starting to combine sounds to form phrases and larger structures. Eventually, the encoded audio will be finalised and copies may be issued on a given medium, such as magnetic tape, vinyl disc or, as is now common, CD or DVD. At this stage, the composer has finished recording, manipulating and structuring sounds and has thus completed the compositional process.

1.2 The Fixity View

Some ontologists believe that acousmatic sounds are *fixed* during the compositional process and are, as a result, merely *played back* rather than *performed*. This section introduces such a view, drawing upon the writings of

[14] Pierre Schaeffer once suggested that the term *musique plastique* might be a more appropriate than the term *musique concrète*: "it is amusing to ask whether the term *plastic music*, or even *plastic sound*, would be appropriate" (Schaeffer 1952, p. 115).

Linda Ferguson (1983) (Section 1.2.1), Stephen Davies (2004) (Section 1.2.2), Stan Godlovitch (1998) (Section 1.2.3) and Andrew Kania (2005) (Section 1.2.4). The views of these theorists are challenged in the following section, which considers the instantiation process (Section 1.3), and the following chapter, which considers acts of acousmatic performance agency (Chapter 2).

1.2.1 Linda Ferguson's View

In 1983, Linda Ferguson considered some of the compositional processes typically employed in the creation of tape compositions; she started by discussing sound recording and sound synthesis before considering some of various ways in which tape composers transform and manipulate sounds. Ferguson went on to suggest that the methods involved in the creation of tape compositions are dissimilar to those employed elsewhere:

> To compose music has traditionally been, as Barthes put it, "to give to do." Since the late 1940s and the beginnings of tape composition, it no longer need mean that [...]. We are concerned here with those cases where "to compose" means something other than "to give to do," since the tape composer does not ultimately provide symbolic formulae or directives. He works in the concrete rather than the abstract, directly with the sonorous matter of his art.
>
> (Ferguson 1983, p.19)

Ferguson goes on to suggest that the *sonorous matter* of tape composition is determined by a composer rather than a performer. Once again, this is deemed to rupture the ostensible ontological paradigm:

> [...] the sonorous aspect of music has been traditionally understood to be the product of the process of performing, not the product of the process of composing.
>
> (Ferguson 1983, p.19)

Ferguson concludes her argument by suggesting that it is not possible to perform tape compositions on the grounds that: "The expressive element of performance

– interpretation - is not admitted in tape composition, and the expressive content is already present, concretely determined by the composer." (Ferguson 1983, p.20). This claim is used to validate her central ontological thesis: "tape composition is not music because it is in essence something other than music as it has been traditionally understood" (Ferguson 1983, p.17).

1.2.2 Stephen Davies' View

In recent years, Ferguson's argument has been updated. For example, in *Musical Works and Performances; a Philosophical Exploration,* Stephen Davies considers the compositional methods employed in the creation of *electronic music* (also described as *purely electronic music*)[15] (Davies 2004, p.25). Like Ferguson, Davies suggests that electronic composers work directly with sound materials during the compositional process before suggesting that the resulting music is for *playback* rather than *performance*. We shall briefly consider his view.

Stephen Davies' discussion of electronic music may be divided into two distinct stages. In the first stage, he considers the compositional methods involved in the creation of electronic music, noting that the composer has an unprecedented degree of control over their chosen sound materials:

> In electronic compositions, the composer works more or less directly with the sounds that concern her, rather than instructing others on how to make them, and this allows to her much more control of their detail, which she is able to incorporate within her work by giving it an electronic representation [...].
>
> (Davies 2004, p.28)

He goes on to suggest that this compositional method produces music that is extremely detailed:

> The electronic work, because it comes via a tape, record, or disc, is at the level of acoustic detail that these media are

[15] Davies does not use the term *acousmatic.* However, he offers Schaeffer's *Étude Pathétique* (1948) and Eimert's *Four Pieces* (1953) as paradigmatic examples of *electronic music* (Davies 2004, p.25).

> capable of storing and later conveying. Because an electronic work is sounded directly when it is instanced, the properties defining it are at the same level of detail as those characterizing performances, whereas the work-defining properties of pieces created for performance are not so fine-grained.
>
> (Davies 2004, pp.26-27)

The above point leads Davies onto the second stage of his discussion; composers of electronic music issue tapes or discs rather than musical scores and, as a result, their works are mediated by a decoding device rather than a performer's efforts. In other words, electronic music is so detailed that it can be presented without recourse to agential acts on the part of a composer. Electronic music is: "created for playback, not for performance" (Davies 2004, p.25).

1.2.3 Stan Godlovitch's View

A similar view is held by Stan Godlovitch who, in *Musical Performance: a Philosophical Study*, considers the ontology of musique concrète, electronic music and computer music (Godlovitch 1998). Like Davies, Godlovitch suggests that composers working within these various traditions have ultimate control, since they deal directly with recorded or synthesised sound materials. He goes on to suggest that they produce music that is entirely determined during the compositional process and thus for playback rather than performance. Godlovitch starts by discussing computer music:

> Computer use [...] 'liberates' the composer from the performer and the limits of conventional instruments. If, so to speak, the composer is first-person to the work as the player is its third-party, computers rid the composer of all third-party intervention. The result means the elimination of performance as such and its displacement by 'pre-cast' or 'presented' music; that is, playback which has been utterly and finally set up in advance.
>
> (Godlovitch 1998, p.101)

Godlovitch goes on to discuss musique concrète:

> *Musique Concrète* [...] challenges no performance conventions because it was never meant to include any role for performers.

> The *concrètiste's* immediate product is a master tape. *Musique concrète* pieces are not performable. They admit only of 'soundings', the aural counterpart to the 'viewing' or 'screening' made possible by the film projectionist. [...] much of computer and electronic music is meant for unperformed, uninterpreted display over which composers have complete control.
>
> (Godlovitch 1998, p.111)

He follows on with this observation about electronic music:

> For some composers, musicians introduce an uncontrollable indeterminacy in the form of third-party interpretation. Electronic music is not executed, and so is uninterpretable by an executant. Like bronze, it is cast, and persists historically independent of and uninfluenced by any performance traditions. By fixing the last detail of each sound, nothing remains for any performer to do.
>
> (Godlovitch 1998, pp. 117-118)

Godlovitch concludes his lengthy discussion of computer music, musique concrète and electronic music by suggesting that they all are for playback rather than performance. In this context, he assimilates playbacks with the process of minting coins, believing that both strive for instantial uniformity where instantial novelty signals a flaw (Godlovitch 1998, p.89).

1.2.4 Andrew Kania's View

Godlovitch's view is clearly supported by others. For example, Andrew Kania, a well-known musical ontologist, takes a very similar approach:

> Shortly after the Second World War, some classical composers began focusing on producing works that did not require any performance. Using technology developed to record and reproduce the sounds of performances, they began creating tapes that when played back produced sound events that could not be considered an accurate record of any performance occurring in the studio, in any sense. [...] In such 'electronic music', the sound of the work, in an important sense, came straight from the composer, without the mediation of a performing artist.
>
> (Kania 2005, pp.134-135)

In this short statement, we find one of the clearest examples of what one may call *the fixity view*; Kania believes that the acousmatic composer predetermines sounds and this: "results in tapes (or other media) for playback rather than pieces for performance" (Kania 2005, p.34). Kania concludes with the following observation: "[…] if electronic works are not counter-examples to a theory of Western classical music as a tradition of works for performance, you might wonder what *would* qualify as a counter-example" (Kania 2005, p.34). We shall now consider the validity of the fixity view, focusing upon the instantiation process.

1.3 The Instantiation Process

The views of Linda Ferguson (1983), Stephen Davies (2004) Stan Godlovitch (1998) and Andrew Kania (2005) are extremely similar. However, none of these theorists seek to explain what they mean by their use of the term *playback,* and, further to this, they do not consider whether playbacks are an appropriate method for the presentation of acousmatic music. As a result, these theorists fail to acknowledge certain playback-related problems. This section starts with a discussion of acousmatic *playbacks*; introduces and explains a playback *objective* and questions whether this objective is achievable.

It is certainly *possible* to playback pieces of acousmatic music. This involves a decoding of the encoded medium, presenting the music using either headphones, loudspeakers or a loudspeaker array. The number of loudspeakers employed will depend upon the nature of the encoded audio[16]; encodings may include numerous different channels and thus presupposes a specific loudspeaker configuration. In many cases, pieces of acousmatic music have two stereophonic channels of encoded audio and thus presuppose a minimum of two-channel stereophonic reproduction, as shown in the diagram below:

[16] As Jonty Harrison points out: "'tape playback' is exactly that, the number of loudspeakers in public performance venues corresponding exactly to the number of tracks on the 'tape'" (Harrison 2000, p.1).

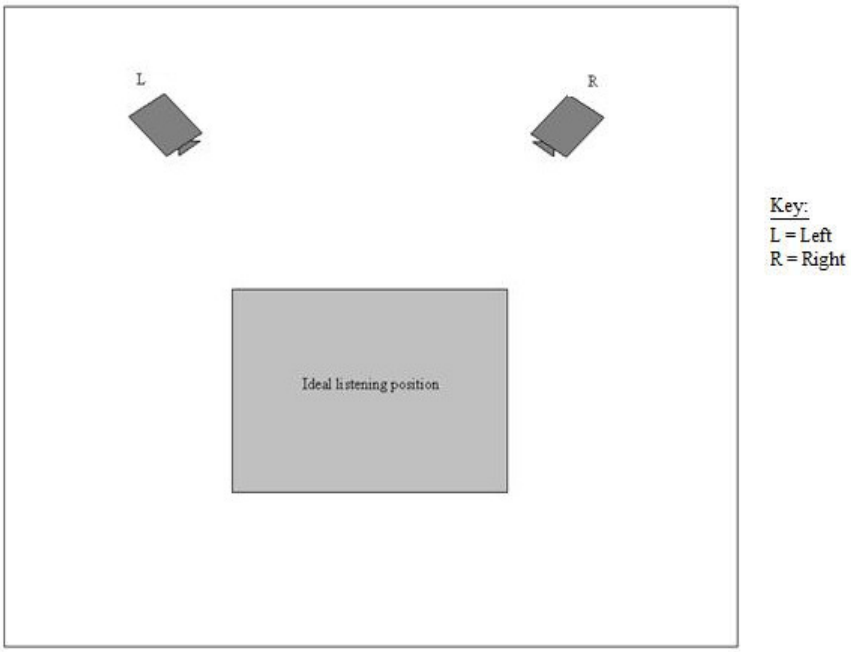

Figure 1: Stereophonic loudspeaker configuration

In some cases, pieces of acousmatic music have more than two channels of encoded audio and are referred to using the term *multichannel*. There are numerous different multichannel formats that composers may use and, in theory, the composer may create works with any number of channels. Despite this, multichannel encoding often adheres to standard formats; amongst these are four encoded audio channels (*quadraphonic*), six encoded audio channels (often found in a configuration known as *5.1-surround*) and eight encoded audio channels (which may be configured as either *7.1-surround* or *octophonic* depending upon the configuration in use). Multichannel pieces presuppose a reproduction system in which the number of loudspeakers matches the number of encoded audio channels as shown in the following diagram:

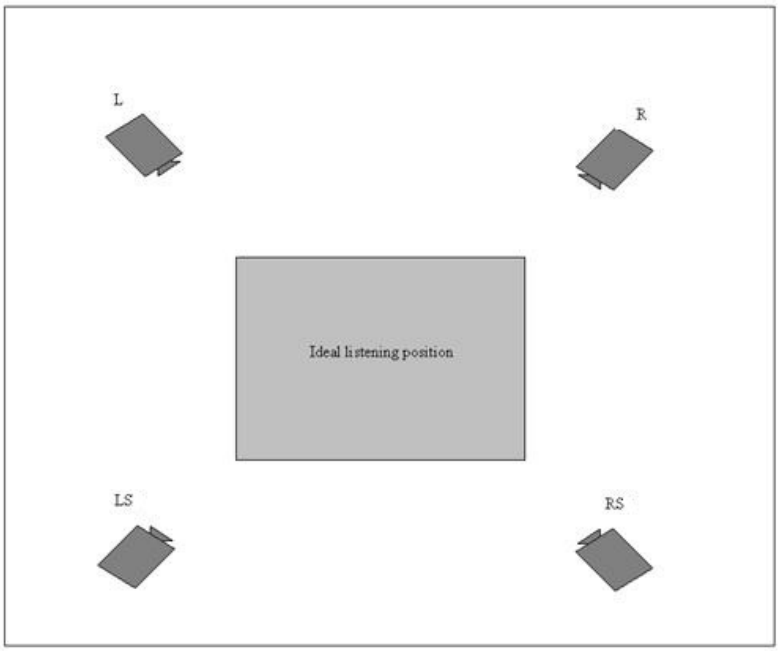

Figure 2: Multichannel (quadraphonic) loudspeaker configuration

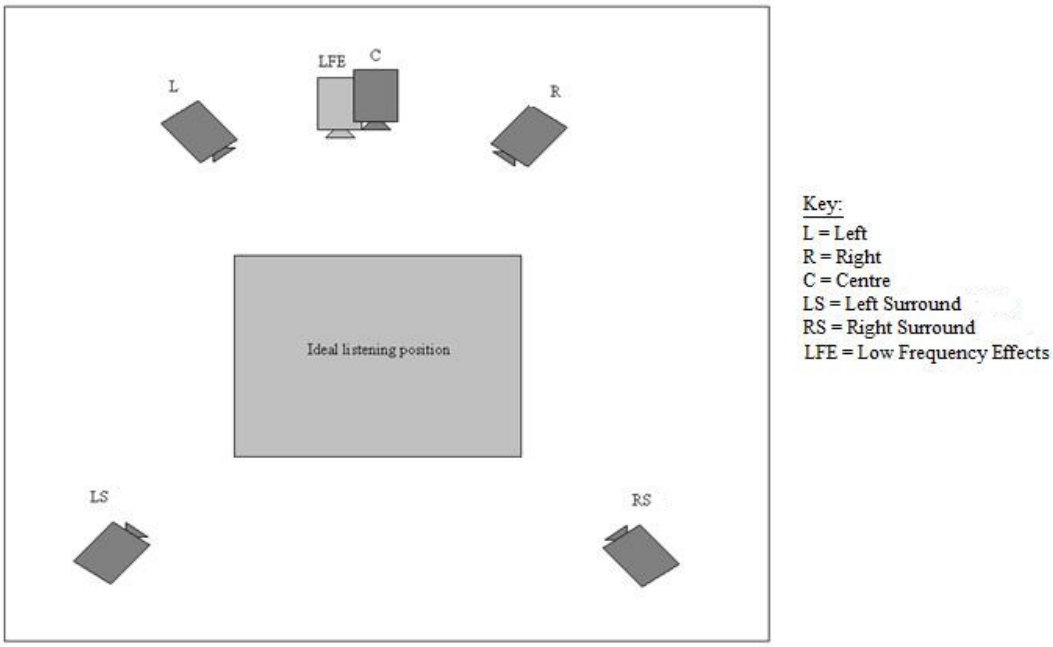

Figure 3: Multichannel (5.1) loudspeaker configuration

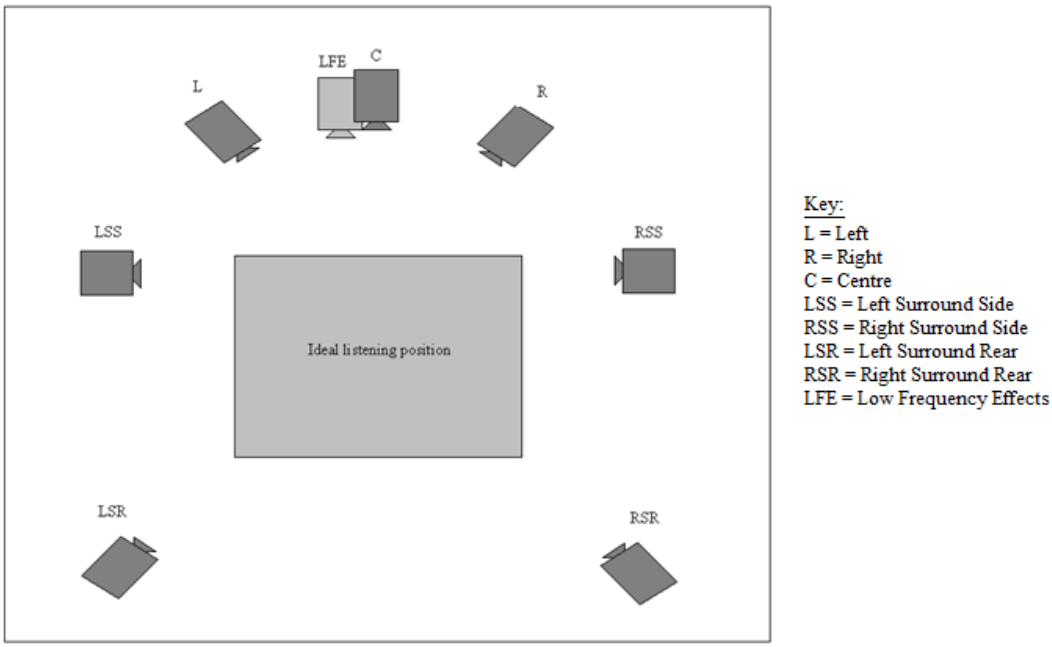

Figure 4: Multichannel (7.1) loudspeaker configuration

During a playback, the encoded medium is decoded and presented using the appropriate loudspeaker configuration. The primary objective is to:

> [...] present the listener a soundfield as near as possible to that which the composer heard in the studio during composition or – a slightly weaker argument – may be heard on 'very high quality' close field monitors in any studio.
>
> (Emmerson 2007a, p.148)

This short statement serves to highlight what one might call *the playback objective*; the playback reveals (or at least seeks to reveal) the work as heard during the act of composition[17].

Ferguson, Davies, Godlovitch and Kania presumably believe that the playback objective is achievable. However, this is not necessarily correct; playbacks often fail to present the music *as heard by the composer* and, as a result, fall short of meeting the primary objective. This is largely due to the fact that composers are used to hearing their music within a composition studio but their music is rarely presented in such spaces post-composition. Instead, as Jonty

[17] This point is echoed by Harrison, who says that the objective of the playback is: "the supposedly exact recreation of the piece as heard by the composer in the studio" (Harrison 1999, p.1).

Harrison points out, they are typically presented in concert halls or similar public performance venues (1999)[18] and, as Simon Emmerson points out: "The studio does not resemble a concert hall" (Emmerson 2008, p.148). We will briefly explore Emmerson's point, identify some of the key differences between studios and concert halls and thus undermine the playback objective.

The process of decoding audio is never transparent[19] – the type of the encoded medium employed, the algorithm or method used to access the code, the type of loudspeaker system used to replay the sound, the specific type of loudspeaker employed[20], the placement and number of loudspeakers, the various objects situated in front of and around the loudspeakers, the position of listeners relative to the loudspeakers and the acoustic qualities of the listening space are amongst the various factors influencing such a process. Thus, the decoding process, no matter where it takes place, has an impact upon the sounds that emerge as a consequence of decoding.

The composition studio seeks to marginalise the various factors influencing the decoding process by offering a relatively stable, often bespoke, listening environment; the room acoustic, the studio layout and the available equipment may (or may not) be ideal. However, such features are unlikely to change throughout the compositional process, and, as a result, the composer may become accustomed to the studio environment and thus anticipate, or even forget, the influence that the studio exerts upon the encoding and decoding of sounds. In short, the composition studio offers the illusion of decoding transparency.

The concert hall may offer a relatively stable listening environment. However, it is likely to differ, often substantially, from the listening environment found in the studio. The most obvious difference is that of scale; the concert hall, by virtue of the requirement to engage an audience, is likely to

[18] This is not to suggest that the concert hall is the best place for the presentation of acousmatic works: "Leaving aside the interesting but thorny question, not strictly relevant in the current context, of whether the 'concert', with its behaviour codes and anachronistic rituals, is the most appropriate format for electroacoustic music anyway, the last half century has nevertheless seen much of this kind of public presentation." (Harrison 1999, p.120).

[19] This point has been made, at length, by Brown (1996) and Echard (2008).

[20] Harrison and Wilson have noted that loudspeakers: "[...] cannot be treated as strictly neutral and transparent conveyors of fully and ideally realised sound material" (Harrison and Wilson 2010, p.240).

be much larger than the composition studio[21] and this often means that it is difficult, if not impossible, to replicate the conditions under which a composition was created; it is particularly difficult to ensure that the position of the loudspeakers, and the position of the listener(s) in relation to the loudspeakers, matches that of the studio. The consequences of this have been discussed by Jonty Harrison:

> If a stereo piece is played over a stereo pair of loudspeakers (even large speakers) in a large hall, the image will be even less stable and controllable than in a domestic space, and will certainly not be the same for everyone in the audience […] Listeners at the extreme left or right of the audience will receive a very unbalanced image; someone on the front row will have a 'hole in the middle' effect, whilst a listener on the back row is, to all intents and purposes, hearing a mono signal!
>
> (Harrison, 1999b, p.121)

The potential for inadequate listening positions is compounded by the problem of phase cancellation. This often occurs in cases where there is a substantial distance between a loudspeaker and a listener and is particularly pronounced in cases where temperature and humidity variations and air movements create unwanted and continually varying changes in the phase of a signal (Doherty 1998, pp.9-10). This may, in some cases, result in variations in the phase relationship between the left and right loudspeakers, potentially cancelling out certain frequencies but also affecting the listener's ability to locate sounds by destroying spatial cues (Rumsey and McCormick 2006, p.446). Along similar lines, the acoustic qualities of the concert hall are likely to differ from the acoustic qualities of the studio. According to Frank Henriksen, such differences are likely to reflect, diffract and absorb sounds in ways that the composer cannot necessarily anticipate in the composition studio (Henriksen 2002, pp.72 - 75). He goes on to suggest that reflections, diffractions and absorption affect the

[21] There are various other differences which may be less obvious. For example, the performance system may use a different algorithm to access the code and it may use various different loudspeakers than those employed during the creation of a work. These factors all influence the decoding process and, crucially, differentiate the decoding process from that encountered in the studio.

spectral makeup, spatial location and, most importantly, the dynamic contours of a given work (Henriksen 2002, pp.72 - 75).

With the above in mind, the playback objective seems somewhat unrealistic. It is difficult to present the acousmatic work *as heard by the composer in the studio* in cases where the concert hall reflects, diffracts and absorbs sounds, and these potentially significant issues are invariably compounded by less-than-ideal listening positions. In such cases, the playback objective is clearly not achieved.

Playback advocates may argue that the various differences between studios and concert halls are unavoidable, incidental and largely irrelevant to both composers and listeners. However, this view, should it be encountered, is starkly at odds with the epistemic practices of (most) acousmatic composers; since these composers spend a significant proportion of the compositional process sculpting, crafting and shaping their chosen sound materials, it is reasonable to assume that the differences between studios and concert halls are (at least potentially) highly problematic. This observation is, in effect, a reversal of the ontological claims of Ferguson, Davies and Godlovitch; reverberation, reflection and absorption are problematic *because* the composer has such a high degree of control over sound materials[22].

The above point may be demonstrated by reference to Denis Smalley's notion of spatial consonance and dissonance (Smalley 1991). In *Spatial experience in Electro-Acoustic Music*, Smalley suggests that acousmatic composers think of spatial imaging as a means of enhancing the sounding properties inherent in sound materials and their structural functions, before describing such imaging, as considered by the composer and composed into the work, as a *composed space* (Smalley 1991, p.123). He goes on to note that the composed space is typically transferred to a *listening space*, such as a concert hall, before differentiating between the composed space and the listening space, noting that the former will have been embedded in the musical content of a work whereas the latter will usually lie outside the composer's control. Despite this, the listener is confronted with what Smalley refers to as a superimposed space –

[22] Jonty Harrison appears to agree with this point: "[…] it seems strange that the acoustic peculiarities of the public playback space itself are frequently given little consideration in [tape playback]" (Harrison 2000, p.1).

a nesting of the composed spaces within a listening space (Smalley 1991, p.123). This nesting process may have certain significant consequences, as outlined below:

> The superimposition process causes acoustical changes which have consequences for the perception of musical content and structure, particularly in public spaces. The public space, where listeners are distanced from loudspeakers, undermines the sonic articulation and clarity considered so important and dealt with so carefully by the composer in the studio-space where the work was created. This is the negative consequence of the act of transference.
>
> (Smalley 1991, p.123)

Smalley goes on to suggest that the superimposition process does not necessarily have a negative impact upon a given instantiation and, to demonstrate this point, he introduces the terms *spatial consonance* and *spatial dissonance* as a means of discussing the relationship between the composed space and the listening space (Smalley 1991, p.123). In some cases, the spatial images present in acousmatic works are consonant with the listening space. However, this is not always the case; an intimate, composed-space presented within a large listening-space (dissonant spatial relationship) may result in a loss of intimacy that will potentially obstruct the listener's apprehension of the musical content (Smalley 1991, p.123).

Smalley goes on to suggest that the issue of consonant and dissonant spaces is not always acknowledged by composers and performer. The following point appears to counter the playback objective, as set out within this thesis:

> Surprisingly there are many composers who remain ignorant of superimposed space and the potential of diffused space, both because they lack sufficient direct comparative experience, but more seriously because they possess a fixed «image» of their music as conceived and perceived within the composed space of recorded formats.
>
> (Smalley 1991, p.124)

The above statement clearly opposes the fixity view proposed by Ferguson, Davies and Godlovitch; composers may *think* of the instances of their works as

fixed, unalterable and identical but they fail to acknowledge the potentially significant impact of superimposed space.

With the above point mind, one may agree with Jonty Harrison, who suggests that: "it is the medium which is fixed, not the music" (Harrison 1999a, p.1). Harrison goes on to note that the influence of listening spaces will remain problematic unless something radical is done; he is referring to the need for performance agents who are, in the acousmatic tradition, associated with the practice of sound diffusion (Harrison 1999a). Such a practice is often employed: "[...] to ensure the presentation of that which is consonant, and hopefully to compensate for the dissonant and possibly thereby to enhance the total experience" (Emmerson 2007a, p.149), and this leads some acousmatic composers and theorists to suggest that the term *performance* may be applied to the presentation of acousmatic music:

> I would argue that the notion of performance can still be applied specifically to diffusion in the public presentation of electroacoustic works. It is significant that it remains the one real-time process of modification. [...] While it is true that the sound diffuser does not actually create the sounds there is a clear sense that without diffusion the works would be impoverished.
>
> (Dack 2001, p.88)

With this in mind, the following chapter considers the practice of sound diffusion and suggests that performance agents are fundamental constituents of the acousmatic musical performance.

1.4 Summary

This chapter introduced both the compositional process and the instantiation process. It considered the views of some ontological theorists, who believe that the compositional process involves the fixing of sounds and describe acousmatic instantiations as *playbacks* rather than *performances*. The following point was raised in response: it is certainly *possible* to play back acousmatic sounds. However, they are not *fixed* and are, as a result, often affected by the acoustic

influence of listening spaces and the inevitable lack of decoding transparency. Some composers may ignore this point. However, many acousmatic composers attempt to counter the effects of the listening space by employing performance agents, as discussed in the following chapter (Chapter 2).

Chapter 2: Agents

The acousmatic musical performance involves a human agent, known as a *performer* or *sound diffuser*[23]. This chapter introduces and explains the role of the human agent; Section 2.1 considers the performance systems that they use, Section 2.2 surveys some of the diverse and multifaceted agential acts that they *may* employ, and Section 2.3 describes some of the various skills and intentions that underpin such acts. Taken as a whole, the three sections within this chapter present the acousmatic performance as an agent-centred enterprise that serves both composers and listeners. This paves the way for a discussion of both acousmatic works (in Chapter 3) and interpretations *of* works (in Chapter 4).

2.1 The Sound Diffusion System

The vast majority of acousmatic performances involve both a human agent and a sound diffusion system. This section provides a basic and brief introduction to the architecture of an idealised sound diffusion system and considers the point of agential contact. The following section considers some of the various ways in which diffusion systems may be used (Section 2.2).

Most diffusion systems link a decoding device (such as a CD player, a DVD player or a computer hard-drive) to a loudspeaker array. The number of loudspeakers in the array is often greater than "the number of tracks on the 'tape'" (Harrison 1999a, p.1) and will be fixed in a certain formation for the duration of a given performance (Mooney 2005, p.169). The decoding device is used to send a signal to the array. However, this signal is typically mediated by a mix engine and a control interface. A mix engine carries out various tasks, including signal routing, mixing and signal processing and often multiplies the incoming signal so that it may be sent to all of the various loudspeakers within the array (Mooney 2005, p.169). The various tasks undertaken by the mix engine will be determined according to control data that is received from a

[23] The human agent may be a composer. However, this is not always the case, and thus: "The roles of composer and performer [...] may be separated" (Emmerson 2007a, p.31).

control interface, such as a mixing desk[24] (Mooney 2005, p.168). The control interface is typically the point of agential contact; the human agent engages directly with the control interface and is able to regulate the level of the signal being sent from the source to the loudspeaker array. This typically involves the real-time movement of faders on a mixing desk, enabling the performer to increase or decrease the amount of signal being sent from the decoding device to any given loudspeaker, or set of loudspeakers, within the array.

With the above in mind, one may summarise the four main components (decoding device, control interface, mix engine, and loudspeaker array) of an idealised sound diffusion system, as shown in the following graphical representation:

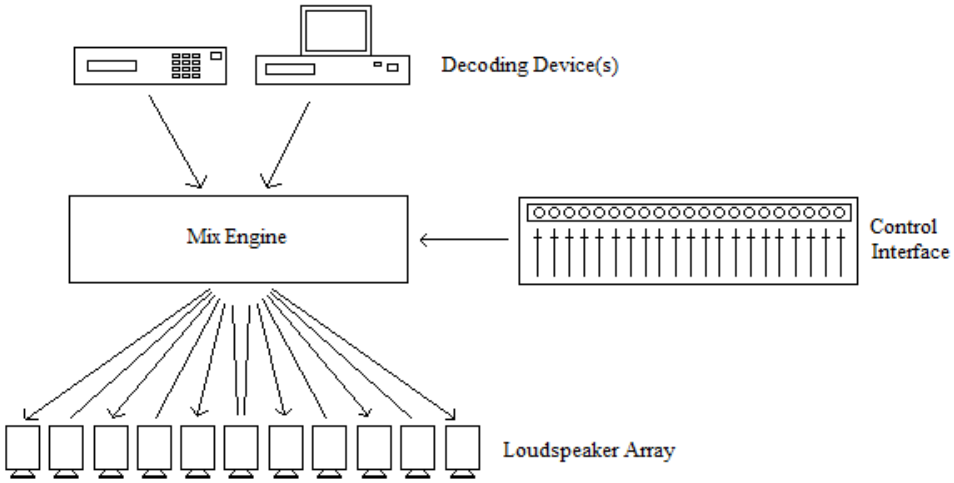

Figure 5: Graphical representation of an idealised diffusion system (Mooney 2005, p.168)

The above diagram shows the four main components of an *idealised* diffusion system. Real systems, which are extremely numerous, often conform to this ideal. However, they invariably differ depending upon the type of decoding

[24] Some diffusion systems employ additional or alternative interfaces. For example, the *alternative eXpresssive input Object* (aXi0) system built by Brad Cariou at the University of Calgary employs velocity sensitive MIDI keyboards, a series of buttons and a computer joystick (Eagle 2012). Other systems have employed gloves which are worn by the performer and connected to sensors which enable the real-time control over certain spatial parameters (Graugaard 2005).

device, control interface and mix engine that is employed and, in some cases, the mix engine performers pre-determined bespoke processes that are particular to a given system[25]. Above all, the most significant difference relates to the type, number and placement of loudspeakers within the array. To demonstrate this point, a number of well-known diffusion systems are introduced and explained in Appendix II.

It is possible to automate some sound diffusion systems. This allows for specific acts to be determined (often by the composer) in advance and this typically means that the human agent has no role (and, arguably, that the music is not performed but played back). Despite this, automated diffusion is extremely rare; as Jonty Harrison points out, there are numerous reasons why acousmatic composers hardly ever employ automation:

> As well as the cost implications of developing an automated system, there are compositional and performance issues involved. Ideally, the automation would be composed *on* the performance system *in* the performance space (and the cost of that is usually prohibitive). If another performance were to take place in a different space with a different system, then the automated version is hardly any more durable than an individual real time manual performance. Even at the most fundamental level, performance spaces behave differently in concerts from the way they behave in rehearsals - some kind of intervention to update and correct for the presence of the audience is musically inevitable.
>
> (Harrison 1999a, p.12)

With the above in mind, it seems reasonable to assume that even automated sound diffusion will involve a human agent and, since automation is extremely rare, the agent's position remains central.

Some acousmatic composers and performers clarify the centrality of the human agent by describing diffusion as a form of *playing*. This term highlights the various connections between acousmatic and non-acousmatic performance traditions. However, it also serves another function; sound diffusion systems are

[25] For example, the mix engine used in the Cybernéphone, a diffusion system designed by Christian Clozier, includes a bespoke frequency splitting device, known as the Gmebahertz; this subdivides the decoded audio signal into multiple frequency bands which are then distributed to the loudspeaker array (Clozier 1998, p.268).

often described as instruments, ensembles or orchestras and, in this context, the term *playing* appears to links the human agent's various acts with instrumental activity, as is clear from Simon Emmerson's discussion of two diffusion systems[26]:

> Both looked superb in addition to their sounding – but I will not say they intrinsically 'sounded superb' because, of course, as an instrument they had to be played by performers, and the concept of virtuosity still applies. There can be 'good' or 'poor' performances. This seems strangely at odds with the developing philosophy in the field which stressed the 'transparency' of the technology.
>
> (Emmerson 2007b, pp.85-86)

With the above in mind, it seems reasonable to suggest that sound diffusion involves an *active* (as opposed to a *passive*) process; it takes place in real time, involves direct, physical acts on the part of the performance agent and, as a result, the term *playback* seems entirely inappropriate. The following section considers some of the various acts that *may* be employed within the practice of sound diffusion and thus furthers the claim that this practice involves acts of agential performance (Section 2.2).

2.2 Agential Acts

The previous section introduced sound diffusion systems and considered the point of agential contact (Section 2.1). This section considers some of the various ways in which human agents might use such systems and thus presents an idealised view of sound diffusion, concentrating upon what is *potentially* possible[27]. The discussion is divided into two sections; Section 2.2.1 considers *corrective acts* and Section 2.2.2 considers *expressive acts*. This distinction serves the current thesis and facilitates the ensuing debate. However, it is worth

[26] Emmerson is referring to the Gmebaphone/Cybernéphone and the GRM Acousmonium; see Appendix II for a brief introduction to these diffusion systems.

[27] What is *potentially* possible must be balanced by what is *actually* possible; agential acts are often limited by the nature of the diffusion system, the size and shape of the performance space and the abilities of the sound diffuser. These ostensible limitations are introduced and discussed throughout this section and the following section (Section 2.3).

noting an agential act may be both corrective *and* expressive and, more importantly, the human agent may navigate between these two ostensible polarities within a given performance. This point is clarified below.

2.2.1 Corrective Acts

As discussed in Section 1.3, sound diffusion is often employed to marginalise the acoustic influence of listening spaces and frequent lack of decoding transparency. Accordingly, acts of sound diffusion are often *corrective*, serving to present a soundfield similar to that which is heard during the compositional process. This point was raised by Jonty Harrison in a recent talk:

> [...] sound diffusion (which grew up mostly around stereo works, but whose principles can be scaled up to embrace multichannel pieces) is **primarily corrective** – making as audible and available as possible to the listener what the performer knows to be there on the fixed medium and which is almost certainly compromised by the listening conditions of a public auditorium.
>
> (Harrison 2011, p.5)

With this in mind, it seems reasonable to suggest that (at least *some*) acts of sound diffusion are corrective; we shall briefly consider the nature of such acts.

Throughout his various publications, Jonty Harrison identifies a range of sound diffusion techniques that may be employed to marginalise the effect of public listening spaces. Amongst these, he advocates the following approach for *correcting* the dynamic range; by raising and lowering the faders on the mixing desk, the human agent may, where necessary, correct what the composer intended:

> [...] the composer will have indicated relatively louder and quieter events. [...] I would, at the very least, advocate enhancing these dynamic strata – making the loud material louder and the quiet material quieter – and thus stretching out

> the dynamic range to be something nearer what the ear expects in a concert situation.[28]
>
> (Harrison 1999b, pp.120-121)

Harrison goes on to discuss spatial images. He suggests that a (potentially large) number of loudspeakers may be activated to ensure that all members of the audience receive a spatial image that is more-or-less consistent with that intended by the composer and, with this in mind, he remains primarily focussed upon the *corrective* nature of diffusion. (Harrison 1999b, p.121). At this point, Harrison describes a particular loudspeaker configuration known as the *main eight* - as employed in a diffusion system known as BEAST (Birmingham ElectroAcoustic Sound Theatre) (Harrison 1999b) (see Appendix II). Harrison explains his rationale for the placement of these loudspeakers in relation to the corrective nature of sound diffusion; the various loudspeakers are positioned so that spatial images "can be perceived by everyone" (Harrison 1999a, p.3).

Most of Harrison's various suggestions relate to stereo pieces. However, larger listening spaces, and the broader issues associated with the decoding of audio, also affect multichannel pieces, albeit differently; when presented in large, public listening situations, pieces of multichannel music are much more stable than their stereo counterparts. There are two main reasons for this. Firstly, multichannel pieces have a much larger dynamic range than stereo pieces; this invariably means that the acoustic influence of a larger space, which often reduces the dynamic range of the stereo pieces, has far less of an impact. Secondly, multichannel pieces, which make use of an array of loudspeakers, may present the listener with extremely robust spatial images; the multichannel acousmatic composer may employ all of the various speakers within the array to create extremely detailed, multichannel spatial images and are often able to situate the listener within the array, thus avoiding issues related to the listener's position relative to a stereo image. Accordingly, it is much easier for the

[28] A similar point has been made by Denis Smalley: "In a recorded format you can never achieve an ideal dynamic range that will suit all spaces and contexts; maybe it is not even ideal on two loudspeakers. And so you need to exaggerate or highlight the high end – lift the top levels up – and possibly drop the low levels down. Extending the dynamic range affects peoples' perceptions of the piece and permits and enhancing of the structural shape." (Smalley 2000, cited in Austin 2000).

performer to *correct* what they know to be there on the fixed medium, since the presentation is much less prone to spatial distortion. Corrective agential acts *may* be employed in the case of multichannel works. However, this typically involves relatively minor adjustments to the signal being sent to individual loudspeakers to ensure that the level is consistent across the multichannel array. In some cases, the dynamic range may be enhanced across the entire array. However, this is only really necessary in cases where the acoustic influence of the listening space is particularly extreme.

Linda Ferguson (1983), Stephen Davies (2004), Stan Godlovitch (1998) and Andrew Kania (2005) do not discuss sound diffusion and there is no evidence to suggest that they are aware of this practice. However, they would probably suggest that diffusion is *in the service of* the playback objective (as discussed in Section 1.3) and therefore largely consistent with their ontological theories. In some respects, this would be correct; sound diffusion *is* primarily corrective and often *does* seek to present the listener with a soundfield similar to that which was heard by the composer during the compositional process. With this in mind, one *may* suggest that sound diffusion is (at least on some occasions) in the service of the playback objective.

The above point requires some further consideration; sound diffusion may be *primarily* corrective. However, it is not *merely* corrective; rather than simply counteracting what is compromised by the listening conditions of a public auditorium, the human agent may take what is known to be there on the fixed medium as a *point of departure*. In other words, the human agent may seek to further dramatise, enhance, enlarge, exaggerate, expand and/or spatialise[29] what is one the fixed medium. In such cases, the agent moves away from the merely *corrective* towards the *expressive*[30] and thus severs any remaining links with the playback objective. The following section considers expressive agential acts and clarifies the distinction between the corrective and the expressive.

[29] This set of examples is not comprehensive. It serves to highlight a distinction between corrective and expressive acts; a detailed discussion of the latter is to follow (Section 4.1).

[30] The term *expressive* has been chosen (at least in part) because it is relatively ambiguous; we are not (yet) in a position to say what these agential acts are expressions *of* - are they expressions of the composer's intentions? Or the music that is being performed? Or the human agent's personal interpretation? These questions are answered in Chapter 3 and Chapter 4. For the time being, the term *expressive,* merely serves to highlight a distinction that holds between agential acts.

2.2.2 Expressive Acts

This section introduces expressive agential acts. The discussion is divided into three parts: Section 2.2.2.1 considers stereo diffusion, Section 2.2.2.2 discusses multichannel diffusion and Section 2.2.2.3 introduces and explains stem-based diffusion. These three sections serve to highlight a distinction that holds between corrective and expressive agential acts and present an idealised view of sound diffusion, focusing upon what is *potentially* possible during the act of sound diffusion. This paves the way for a detailed discussion of performance interpretation (in Chapter 4) in which the use of expressive agential acts is discussed in more detail and contextualised in relation to various limiting factors or constraints.

2.2.2.1 Stereo Diffusion

This section considers some of the various expressive agential acts that *may* be employed during the act of sound diffusion. It starts by discussing the *placement* of stereo materials at various points within the listening space, goes on to discuss the *movement* of such materials and concludes by suggesting that specific placements and movements coalesce, thus forming the backbone of most expressive agential acts. A few brief examples serve to highlight some of the aesthetic intentions that potentially underpin the use of such acts. However, these examples *do not* represent a comprehensive or exhaustive taxonomy, since a full and detailed examination is undertaken later on (Chapter 3 and Chapter 4).

When diffusing stereo works, the human agent *may* situate or place sound materials at various points within the performance space, using any number of loudspeakers from a single stereo pair to the full loudspeaker array. Single stereo pairs may be located at the front of the audience, to the side, rear and, in some cases, above or below. Thus, by placing sound materials on one specific set of loudspeakers, the performer is able to create the impression that sounds are situated at particular points or areas within the listening space. In addition to this, single stereo pairs may be separated by some considerable distance (thus presenting a wide stereo image), they may be placed very close

together (thus presenting a narrow stereo image), they may be close to the audience (often serving to create a sense of intimacy) or located further away (to give a sense of distance and/or perspective). Accordingly, by presenting sound materials over a single stereo pair of loudspeakers, the diffuser is (potentially) able create an impression of: *intimacy* (often by using a stereo pair that is close to the audience, perhaps with a narrow stereo image), *immensity* (in cases where loudspeakers are located further away and perhaps placed some distance apart), *elevation* (in cases where loudspeakers are located above the audience), *distance* (when speakers are located at a physical distance from the audience, sometimes pointing away from the audience or pointing at a wall), *surprise* (particularly when the stereo image is placed behind the audience), and so on. By the same token, the diffuser is often able to expand or contract the stereo image, by placing sound materials at a pair of loudspeakers that are located far apart or closer together.

The diffuser, who is not restricted to the use of individual stereo pairs of loudspeakers, may employ numerous pairs simultaneously, perhaps adding additional sets of loudspeakers until every speaker within the array is employed in the same agential act. In some cases, the diffuser will employ numerous pairs of loudspeakers to ensure that sounds occupy multiple positions within the listening space. This implies that some degree of (perceptible) spatial separation holds between the various sounds that are placed within the listening space. In other cases, the diffuser will employ a substantial number of loudspeakers to ensure that sounds envelop the listener. This implies that the numerous loudspeakers employed in such an array present a unified spatial image that is not fragmented into discrete points but omnipresent and even immersive. Agential acts that employ multiple stereo pairs of loudspeakers may also create the impression of *intimacy*, *immensity*, *elevation*, *distance*, *surprise*, and so on. However, such acts are typically employed in the presentation of spatial textures[31] and louder, expansive sound materials that suit the immersive situations that they typically suggest.

[31] The term *spatial texture* derives from Smalley (1997) and refers to the way in which spatial perspectives are revealed through time.

In addition to the placement or situation of sound materials, agential acts of sound diffusion often involve the movement of sound materials. Movements are created when the human agent increases the signal sent to one (or more) set(s) of speakers whilst decreasing the signal of others, to create the impression that the sound moves from one to the other. We shall briefly consider some straightforward linear movements before discussing some more complex non-linear movements.

The sound diffuser may employ *longitudinal movements* (where sounds appear to move from the front of the listening space to the back, or vice versa), *lateral movements* (these are typically from side-to-side, although such movements are often composed into stereo works and thus lateral movements are often restricted to the widening or narrowing of the composed image and are often used to give the impression that sounds are becoming closer or further away), *diagonal movements* (where sounds appear to traverse the listening space from one point to another, often from the front right or left to the back left or right, or vice versa, and may include movements from various other points providing that they are neither longitudinal nor lateral), *circular movements* (in which sounds appear to move around or across the audience from one point to another), *vertical movements* (in which sounds appear to move from the listener's position to a higher point in space, often using loudspeakers that are located above the audience) or combinations thereof. Accordingly, the possibilities are manifold; the performer may be able to create specific trajectories, paths and vectors, further dramatise gestural materials by expanding their latent behavioural character, imply a retreat into the distance or an emergence into an intimate space, gradually broaden or narrow the stereo image, expand frontal perspectival space into circumspace[32], elevate materials above the audience, further spatialise textural materials, and so on[33].

[32] The terms *perspectival space* and *circumspace* derive from Smalley (2007); the former is defined as "The relations of spatial position, movement and scale among spectromorphologies, viewed from the listener's vantage point." (Smalley 2007, p.56) and the latter is described as "The spatial distribution or splitting up of the spectral space of what is perceived as a coherent or unified spectromorphology" (Smalley 2007, p.55). These terms are clarified in chapter 4.

[33] As discussed above, this section serves to describe agential acts as central components of the acousmatic musical performance but does not attempt to provide a full taxonomy. Specific acts and their aesthetic functions are discussed in detail in Chapter 4.

The distinction outlined above (between placements and movements) may be conceptually functional. However, the vast majority of agential acts combine placements and movements, thus severing the ostensible distinction outlined above. For example, a sound diffuser may start a particular performance with sound materials located at specific points in the listening space and proceed to move, sculpt and shape those sounds within the space, perhaps eventually arriving at another specific placement before moving off again. In doing so, the diffuser is able to act with fluidity and spontaneity, respond to the musical materials in real-time and make decisions about the acoustic influence of the listening space and the relative position of the audience as the performance develops. Accordingly, agential acts of sound diffusion are often associated with the sculptural acts of the plastic arts (Emmerson 2007a; Harrison 1999a; 1999b).

At this stage, we are in a position to identify a clear distinction that holds between corrective and expressive agential acts; the former serve to counteract the influence of the listening space to ensure that the audience hears something similar to what the composer heard in the composition studio whereas the latter serve to go beyond what the composer heard, taking cues from within the music as a point of departure and employing diverse placements, movements and combinations thereof to sculpt the musical materials into the performance space. These (potentially) diverse agential acts are not aligned with the playback objective, since they do not serve to present the music *as heard by the composer in the studio*.

2.2.2.2 Multichannel Diffusion

In *Imaginary Space - Spaces in the Imagination* Jonty Harrison suggests that multichannel sound diffusion offers a limited range of agential possibilities:

> There is little room for manoeuvre or possibility of elaboration [...] in performance, the ideal situation being the exact replication of the compositional circumstances. This is typically the case of multi-track/multi-channel works.
>
> (Harrison 2000, p.4)

In this short statement, Harrison uses the term *performance.* However, his comments are more readily aligned with the playback objective; given the limited room for manoeuvre, the presentation of multichannel works often involves corrective agential acts that present the music *as heard during the compositional process.* With this in mind, one is often dealing with multichannel *playbacks* rather than *performances*. Despite this, there are certain cases in which the presentation of multichannel music may involve expressive acts. We shall briefly consider this point.

In a recent paper, Jonty Harrison and Scott Wilson describe the practice of multichannel sound diffusion:

> A natural outgrowth of stereo diffusion practice has been multichannel diffusion [...] In essence this approach is similar to its stereo version – that is, it is based on mixing between different sets of speakers in combination – but uses a source medium of greater than two channels. Most commonly this has been done with eight channel pieces, but it has also been done with other channel configurations, for example 5.1. Thus for an eight-channel piece one might have a close ring, a distant ring, a high and/or overhead ring, one or more 'special effects' arrays, and so forth.
>
> (Harrison and Wilson 2010, p.243)

There are, of course, certain restrictions implicit in this description; a diffusion system that can accommodate multiple eight-channel configurations will be very large and will need an equally large public space if it is to be functional. Despite this, some diffusion systems and listening spaces *do* facilitate multichannel diffusion[34] and, although the options remain limited, it is certainly *possible* to diffuse multichannel pieces.

The previous section highlighted a conceptual distinction that holds between placements and movements (Section 2.2.2.1). One may use the same

[34] BEAST (introduced in Appendix II) may include one hundred loudspeakers and facilitates multichannel diffusion (Harrison 1999b). Likewise, the Acousmonium, a system devised by François Bayle and Jean-Claude Lallemand at the Groupe de Recherches Musicales (GRM), may include up to eighty loudspeakers (Savouret 1998) and the Cybernéphone, formerly called the Gmebaphone, designed by Christian Clozier often includes in excess of fifty loudspeakers (Clozier 1998); both of these large systems facilitate multichannel diffusion. These diffusion systems are discussed in more detail in Appendix II.

terms to describe the diffusion of multichannel pieces. In some cases, the diffuser may place or situate the entire multichannel ring at a specific location within the performance space or even blend numerous different rings to enhance the impression of envelopment and scale. In other cases, the diffuser may move between rings. For example, the diffuser may start with a distant ring and gradually move to a more proximate ring and vice versa. Alternatively, the diffuser may move from or to an elevated position. In some cases, the diffuser will isolate specific channels within the multichannel ring and move these without moving the remaining channels. This enables the performer to highlight and situate specific musical materials. Despite this, placements and movements are composed into the multichannel piece and, as a result, the options available for further expressive agential acts remain limited and, in many cases, inaccessible.

2.2.2.3 Stem-based Diffusion

Before concluding this section, it is worth (briefly) considering stem-based diffusion. In recent years, some pieces of acousmatic music have been composed using stems. A stem is a submix of sound materials: "or – more generally speaking – discretely controllable elements which mastering engineers use to create their final mixes" (Harrison and Wilson 2010, p.245). A stem may be mono, stereo or multichannel and a work may comprise numerous different stems in numerous different formats. By using stems, the composer may separate out elements of their works rather than combining them in a fixed media format.

Works composed into stems do not always presuppose a reproduction system in which the number of loudspeakers matches the number of encoded audio channels. Instead, the various encoded audio channels may be combined or separated in response to the reproduction system that is used[35]:

[35] Rock'n'Roll (Harrison 2004) is an example of stem-based composition; this piece has a stereo stem and a six-channel stem: "both images were conceived as independently diffusible, should appropriate speakers be available. Another early example of stem-based composition [...] is Sergio Luque's Happy Birthday (2006), which consists of three stereo stems, intended for near, middle and far presentation, respectively." (Harrison and Wilson 2010, p.245)

> As a simple example, one could imagine a piece consisting of two eight-channel stems, one intended for ear-level localisation, and one intended for a higher location. In a large-scale multichannel system that contained appropriate arrays one could route these stems as desired. In a smaller setup consisting of only eight channels they could both be routed to the same array. Multichannel stems can be further reduced in size of course, through mixing and/or processing, and one could easily imagine how such a piece might be straightforwardly adapted for a quad or stereo system.
>
> (Harrison and Wilson 2010, p.245)

Once again, there are certain restrictions implicit in this description, since large-scale multichannel diffusion systems are not always available and, further to this, the diffusion of stem-based works is in its infancy. At the time of writing, relatively few diffusion systems have been designed with stem-based pieces in mind and are most could not accommodate the discrete manipulation of (potentially numerous) different stems. Despite this, stem-based works are designed with flexibility in mind and thus may be adapted for less substantial systems; stem-based pieces may, should circumstance require it, be presented in stereo or multichannel and, in such cases, agential acts may be described using the various terms and ideas introduced above.

Stem-based composition is likely to become increasingly popular, and the opportunities for stem-based diffusion more readily available. At the time of writing, mono or stereo stems may be diffused using the various corrective and expressive agential acts described above (Section 2.2) and multichannel stems may be diffused if the diffusion system offers the diffuser control over a number of multichannel rings or configurations. Pieces may combine both mono/stereo and multichannel stems, and as a result, all of the various expressive agential acts discussed above may (potentially) be employed within the presentation of a single piece.

2.3 Agential Skills and Intentions

This section briefly surveys some of the central skills involved in the act of sound diffusion and considers some of the various intentions that underpin the deployment of such skills; these include self-regulated intentions, listener-directed intentions and work-centred intentions. The ideas presented in this section are further developed in the following two chapters (Chapter 3 and Chapter 4).

In *Diffusion as Performance*, John Dack describes sound diffusion as an extremely skilful activity:

> [...] a good diffuser will practise and know the limits of the equipment and the effects that the faders will have on the volume and the acoustics of the hall [...]. Skill and the ability to repeat the action under different circumstances are both applicable to the task of diffusion.
>
> (Dack 2001, p.87)

In this short statement, John Dack intentionally counters the views of Stan Godlovitch, who believes that a range of specific and highly-developed skills are involved in the *creation* of acousmatic music, but fails to find evidence of skill during the presentation of such music[36] (Godlovitch 1998, p.111).

Dack is correct to counter Godlovitch's various claims. However, he does not provide any examples to support his argument. This is probably because such diffusion skills are extremely diverse and context-specific; different pieces of acousmatic music require different skill-sets and, along similar lines, different performance spaces and diffusion systems will present different challenges that the performer must overcome. These factors make it very difficult to discuss diffusion skills. However, there are certain skills are common to all acts of sound diffusion; we shall briefly consider these skills before discussing the intentions that underpin their use.

[36] Godlovitch views were considered in Section 1.2. This section employs many of the terms, ideas and values that Godlovitch applies to the notion of *skill* in other musical traditions (Godlovitch 1998, pp.15-30).

The human agent must have an intimate knowledge of the music that is being performed. This requires highly-developed memory skills; information about the work must be stored in the memory so that it can be accessed during the performance and thus serve as a prompt for agential acts. An aide-mémoire, such as a diffusion score or list of timings, may be used. However, this is rarely a substitute for a detailed knowledge of the music and, since there is no formalised method for the scoring of acousmatic sounds[37], this often means that the agent's task is invariably multiplied; the human agent is required to recall aspects of the music *and* recall how their aide-mémoire relates to such music.

The sound diffuser needs to be able to assess whether the listening space is adversely affecting the music that is being performed. Once again, this requires highly-developed memory skills; the performer must be able to assess the content of their immediate experience (in the concert hall) in relation to their prior experience of the music in a different listening space so that the information stored in the memory and the information arising from the performance may be assimilated. With this in mind, a further skill is clearly central; in order that they may assess the impact of the listening space, the human agent must have highly-developed listening/aural skills.

Diffusion systems are often large and unwieldy and, as a result, agential acts require a degree of manual dexterity; the diffuser must make real-time modifications to the sounds leaving the audio source and arriving at the loudspeaker array, and this both requires technical and motor skills. In most cases, the diffuser is raising and lowering faders on a mixing desk and, while this agential act may be relatively straightforward when dealing with a stereo pair of loudspeakers, it becomes increasingly complex when the diffuser is dealing with a substantial loudspeaker array; large diffusion systems may have numerous faders spread out across the mixing desk and this often means that agential control is both a manual and a dexterous accomplishment. Since diffusion takes place in real-time, the agent must be aware of major events in the piece, be able to anticipate their arrival and act accordingly and in a timely manner. Performance offers the human agent no second thoughts or chances, and as a result, their ability to respond in a timely manner becomes crucial.

[37] This point is clarified in Section 4.1.

Thus, sound diffusers must draw upon their memory of the music, the content of their immediate listening experience and act accordingly. This typically means that the mental plans and schemes which organise their memories, their ability to identify the effect of the listening space and their associated acts of diffusion need to become completely automatic and fluent (Davidson 2006, p.144).

Skill does not involve luck or chance but reliability and consistency. This suggests that diffusion skills must be repeatable – the human agent must be able to produce and reproduce an agential act at will. This does not mean that skilful performances are characterised by instantial uniformity. Instead, the ability to draw upon a reliable skill-set will enable the agent to approach the performance in myriad ways[38]; as Stan Godlovitch points out, listeners customarily expect distinctiveness from performers: "much musical performance thrives on the virtues of unique variety and the unexpected by design which are characteristics of creative, that is, anthropoid, agency" (Godlovitch 1998, p.16). He goes on to suggest that unique variety is consistent with a reliable skill-set.

The term *skill* implies that the agent's task is characterised by some degree of difficulty; to have a skill is to perform a (usually difficult) task under certain recognised constraints. Accordingly, skills are associated with challenges, and the realisation of a skill is associated with overcoming such challenges. In the context of acousmatic music, the challenges are manifold, often relating to the particular piece of music that is being performed, the unique characteristics of listening space, the various issues associated with decoding audio, the layout and design of the diffusion system and the position of the audience relative to the diffusion system, amongst others. One hopes to admire and marvel at the skill of sound diffusion and the various ways in which the human agent overcomes the various challenges relative to a particular performance[39]. At the time of writing, there is at least one international competition dedicated to the skill of sound diffusion[40].

[38] This point may be reiterated using the term *interpretation*. The ability to interpret a work involves a specific set of skills that could be included in the current debate. However, we do not consider acts of interpretation until Chapter 4.

[39] It is worth noting that the listener does not always know what the sound diffuser is doing during the act of performance, since the acousmatic listening situation often denies the listen

Like all skilful activities, the skill of sound diffusion develops and matures over time, becoming honed, durable and reliable as the agent becomes more practiced at identifying and overcoming challenges. Despite this, the challenges presented in a specific performance will require a specific solution and this is often dealt with during rehearsals; by rehearsing for a performance, the human agent may engage in repeated listening, focusing in on particular points in the work by listening to sections rather than the whole, and even produce their own aide-mémoire (as discussed above) that will serve to locate and identify specific key moments in the work.

The processes of practising and rehearsing serve to develop highly personalised performance-related intentions. This point is raised by Stan Godlovitch, who notes that these personalised intentions may vary, depending upon the performer, the music that is being performed and the context in which the intended performance takes place:

> One's performing intentions may be more or less rich depending upon one's preparatory deliberations. Performances may be pre-planned down to microscopic details, or run more thinly on rough-hewn notions of overall effect. Whatever the degree of pre-planning, performers must have some notion about the desired outcome, some relatively determinate conception of their intended sound.
>
> (Godlovitch 1998, p.17)

Godlovitch goes on to suggest that one's personal intentions perform a regulative function, which he describes using the term *regulatory intentions*:

> [Regulatory intentions] comprise a normative template which informs the player how well the performance is going and how it went. Without such templates, no performance ranking is possible. Individuals commonly rank their own performances, not necessarily by audience response, but by conformity to their own ideals.
>
> (Godlovitch 1998, p.17)

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access to the gestures and movements employed by the human agent. This point is taken up and discussed in Section 4.1.

[40] *Musique et Recherches*, an organisation based in Belgium, organises a regular diffusion competition in which participants demonstrate their sound diffusion skills in front of a jury and audience. This competition seeks to encouraging professional performers within the field of acousmatic music (Harrison 2011, p.6).

In this short statement, Godlovitch highlights one of the central intentional factors that underpin the employment of agential acts and, although he is primarily concerned with scored, instrumental music, the same applies to the acousmatic performance; the human agent develops self-regulatory intentions through the practice of rehearsing and these are often the means by which the performers assess their own performance during and after the event.

Self-regulated intentions may be extremely important to the sound diffuser and inform their agential acts. However, these intentions must be reconciled with what Godlovitch calls *the point of performance* – musical performances are directed toward an audience:

> Performances are not reflective activities savoured by their agents in solitude. Performances reach out for listeners. They are other-directed, or, in the idiom, 'given'. [...] performances are specifically and directly intended, designed, or meant for audiences. As purposive activities, their *telos* is to be experienced by those for whom the performer prepares them.
>
> (Godlovitch1998, p.28)

The same point applies to the acousmatic performance; agential acts are directed towards listeners. This observation was hopefully implicit in the discussion above; the recreation of dynamic contours and spatial images was discussed relative to a listening position and the use of expressive agential acts was considered as a means of presenting the music *to* the listener during the act of performance. With this in mind, one may supplement self-regulated intentions with listener-directed intentions[41].

Self-regulated intentions and listener-directed intentions are central to the acousmatic musical performance. However, a further intention requires attention; acousmatic performances are always performances *of* something, namely an acousmatic work[42]. With this in mind, it seems reasonable to suggest

[41] This ontological investigation does not devote much attention to the acousmatic listener. The reason for this and the role of the listener are introduced and explained in Appendix I.

[42] This point holds for many musical performances and is, as Nicholas Cook points out, built into our understanding of the term performance: "You can "just play" but it's odd to speak of "just performing," because the basic grammar of performance is that you perform something,

that the performer intends towards an acousmatic work during the act of performance. This observation may seem relatively straightforward. However, it raises a number of significant ontological questions. For example, what *is* an acousmatic work? Where do such works exist? When do they exist? What is the relationship between the work and its various performances? What is the relationship between the work and any associated medium (CD, DVD, vinyl, magnetic tape)? Is it possible to interpret acousmatic works through performance? May one distinguish between authentic and inauthentic interpretations of works?

The above questions require a rigorous and detailed answer if one is to develop an ontological account of the acousmatic musical performance. The following chapter considers the ontological nature of acousmatic works and discusses the various relations that hold between works and their performance (Chapter 3).

2.4 Summary

This chapter introduced the practice of sound diffusion. It considered the architecture of sound diffusion systems and highlighted the centrality of the human agent. Following this, it considered some of the various agential acts that *may* be employed during a given performance, making a distinction between *corrective* and *expressive* acts. The final section discussed some of the various skills and intentions that underpin the human agent's engagement with a diffusion system. Taken as a whole, the sections within this chapter highlighted the *need* for a human agent and the centrality of agential-acts, whilst further undermining the fixity view (as outlined in Section 1.2). The chapter concluded with the following point; acousmatic performances are always a performance *of* something, namely an acousmatic work. The following chapter develops a work-*concept* and considers the various relations that hold between works and performances and considers how this relationship *regulates* and *informs* agential acts (Chapter 3).

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you give a performance "of" something" (Cook 2003, p.204). This view is clarified in the following chapter (Chapter 3).

Chapter 3: Works

This chapter introduces and explains a work-*concept* in order to justify the following claim: acousmatic performances instantiate acousmatic works. The chapter starts by differentiating between performances and works, suggesting that they are numerically, temporally and spatially distinct (Section 3.1). The subsequent section provides an ontological account of the acousmatic work, and surveys three dominant ontological views (the *medium* view, the *class* view and the *type* view) (Section 3.2). The chapter concludes with a discussion of the various relations that hold between acousmatic performances and works; it suggests that works *underdetermine* their various performances, being schematic, indeterminate sound sculptures (Section 3.3). The three sections in this chapter pave the way for a discussion of performance interpretation (in Chapter 4).

3.1 The Performance/Work Distinction

Some musical performances involve *music making simpliciter* – a term used by Stephen Davies to describe "spontaneous and unregulated musical playings that are not of works" (Davies 2004, p.11). Davies goes on to say:

> Extended improvisations are of this kind, as are many doodling and finger exercises. Pure music making always has existed alongside the performance of works and is featured in some highly sophisticated musical categories, such as jazz. [...] Such playing is not intended to instance a work and is not guided by a composer's instructions, whether notational, verbal, or exemplified in a performance offered as a model.[43]
>
> (Davies 2004, p.11)

[43] Davies goes on to clarify this point: "[...] improvising is not random, but conforms to the general social, stylistic, formal, syntactic, and other constraints governing the culture's music. There is another respect in which improvising is structured. The musician usually acquires a repertoire of phrases and figurations. Some of these will be of her own invention and others belong more widely to the performing community. When she improvises, she draws on this stock." (Davies 2004, p.12)

Acousmatic performances do not involve music making simpliciter. Instead, they instantiate works. To demonstrate this point, this section introduces and explains the need to differentiate between acousmatic performances and works, considering three of the fundamental ontological distinctions that hold between them. The ideas presented in this section draw from the writings of Roman Ingarden (1986), Guy Rohrbaugh (2005) and Andrew Kania (2008), but they are not aligned with any particular ontological theory. Instead, the discussion below serves to establish the foundations upon which a bespoke ontological description of acousmatic works and performances may be built (in Section 3.2).

3.1.1 The Numerical Distinction

In *The Ontology of Art*, Guy Rohrbaugh differentiates between *singular* and *multiple* artworks (Rohrbaugh 2005, p.1). He explains this distinction as follows:

> Singular artworks are unique, occurring at only one place at a time. Paintings, collages, carved sculptures, and Polaroids are typical examples of singular works. Multiple artworks are those which are capable of having more than one occurrence in difference places at the same time. For example, a novel may have many copies, a play many performances, a film many screenings, and a photograph many prints. Each of the occurrences is, in some way, a full-fledged presentation of the work.
>
> (Rohrbaugh 2005, p.2)

Rohrbaugh goes on to suggest that singular artworks are simple physical objects[44] (or events), such as paint-covered canvasses or lumps of stone or clay and, as such, we do not make a distinction between the work and its (singular) instance since we intuitively conflate the two. By contrast, multiple artworks are characterised by a numerical distinction that holds between the work and its instances and, as such, it is necessary to differentiate between the two:

[44] The term *physical object hypothesis* was first used by Richard Wollheim (1980) and has since been used elsewhere to describe a wide range of singular artworks (Davies, 2003; Gracyk 2009; Rohrbaugh 2005; Thomasson 2004; Wolterstorff 1992)

> It may be plausible to claim that a painting is a particular material object, or that a jazz performance is a particular physical event, but one cannot identify Alfred Steiglitz's photograph *The Steerage* with any one of its prints or Peter Schaffer's play *Equus* with any one of its performances. [...] the occurrences are potentially many, and one thing cannot be identical to many distinct things. So too, such works survive the destruction or passing of their occurrences, even such epistemologically privileged occurrences as manuscripts and holographs. [Multiple artworks] must be some other sort of thing.
>
> (Rohrbaugh 2005, p.2)

With this in mind, Rohrbaugh concludes that ontologists face: "considerable pressure to adopt at least a dualist ontology of art, in the sense that [artistic] practices appear to embed a distinction between singular and multiple forms of art" (Rohrbaugh 2005, p.2)[45].

Musical works generally fall on the *multiple* side of the singular/multiple distinction; a work may have (potentially) numerous instances and, as a result, one must differentiate between the two. This point has been raised by Roman Ingarden who, in *The Work of Music and the Problem of Its Identity*, suggests that scored, instrumental musical works are necessarily distinct from their (potentially) numerous performances (Ingarden 1986, pp.20-21):

> In contrast to the multiplicity of its possible performances, every specific musical work, like Beethoven's Ninth Symphony, is absolutely unique. This at once rules out its identity with the performances. [...] It is clear that the work is not identical with its performances and is an individual, while any number of performances of it are possible.
>
> (Ingarden 1986, pp.20-21)

The numerical distinction outlined above has been described in various different ways. For example, Stan Godlovitch refers to this distinction using the term *one-many* (Godlovitch 1998, p.85) whereas Stephen Davies employs the term *multi-instantiability* (Davies 2004, p.13). In both cases, these terms, which were

[45] Rohrbaugh's position on multiple artworks is aligned with the theory of types and tokens, as discussed in Section 3.2.

originally applied to works of scored, instrumental music, express the numerical distinction that holds between works and their instances.

The above points may be raised in relation to acousmatic music; acousmatic works have (potentially) numerous instances and, as a result, they fall on the *multiple* side of Rohrbaugh's singular/multiple distinction. Accordingly, the relationship between acousmatic works and their instances may be described using the term *one-many* and/or the term *multi-instantiability*; either way, the result is the same - a numerical distinction holds between acousmatic works and their instances and, since one thing cannot be identical to many things, we must consider this distinction as ontologically significant.

3.1.2 The Temporal Distinction

Acousmatic works exist beyond the temporal boundaries of their various instances and, with this in mind, one may suggest that there is a temporal distinction between them. A similar distinction may be identified in various other artistic traditions and has been discussed elsewhere. For example, in *Works, Recordings, Performances: Classical, Rock, Jazz,* Andrew Kania describes a temporal distinction that holds between scored, instrumental works and their performances using the terms *enduring* and *fleeting*:

> [...] we make a clear distinction between the work and the performances of it. The relevant difference here [...] is between something that is an enduring entity and something else that is a fleeting event. Like works in theatre, dance, and cinema, musical works persist beyond the temporal boundaries of their instances, while musical performances, like dance and dramatic performances and showings of films, are passing.
>
> (Kania 2008, p.5)

In this short statement, Kania uses bespoke terminology to describe something that is widely acknowledged amongst musical ontologists; unlike musical works, performances start and stop at specific points in time, and this implies that they are temporally distinct (Davies 2004; Godlovitch 1998; Goehr 2007; Ingarden 1986; Kania 2008; Kivy 1983; Rohrbaugh 2005).

Kania's point was first raised by Roman Ingarden, who described musical works using the term *persisting* rather than *enduring*:

> Every musical work is an object persisting in time. [...] Having come into existence at a certain moment, it exists as the same product even though the processes through which it came into being have passed.
>
> (Ingarden 1986, pp.15-16)

Ingarden went on to contrast musical works with their performances:

> A performance begins at a specific moment, lasts for a given and measurable period of time, and ends at a specific moment. As a process, every specific performance of a musical work can take place only once. When completed, the performance can neither continue nor repeat itself. It may be followed by another completely new performance in a different time span – different even if remarkably like the first performance – for example, a second playing of the same record on the same gramophone.
>
> (Ingarden 1986, p.10)

Throughout his discussion, Ingarden is primarily concerned with scored, instrumental works of the Western classical tradition. However, it is interesting that he refers to the gramophone, since the playing of a record involves a process of decoding similar to that encountered in the acousmatic tradition. With this in mind, it seems reasonable to suggest that a similar distinction holds between acousmatic works and their instances. The acousmatic musical work is created at a certain point in time. However, it continues to exist even when the composition process has passed and is therefore an *enduring entity* that *persists in time.* By contrast, the acousmatic instance is a *fleeting event,* since it will (to paraphrase Ingarden) start at a certain point time, last for a specific and measurable period of time and, once it has passed, can neither continue nor repeat itself, for it will have ceased to be.

3.1.3 The Spatial Distinction

After discussing the temporal distinction that holds between scored, instrumental works and their performances, Roman Ingarden goes on to discuss

an associated spatial distinction. He starts by suggesting that performances of instrumental works are bound to particular spatial locations:

> Each performance is univocally fixed in space, both objectively and phenomenally – objectively in the sense that the produced sound waves expand in space from a particular point, embracing a defined area; phenomenally, in the sense that the sound products constituting a particular performance and developing as it progresses are perceived by the listeners as reaching them "from over there," "from the platform." We may get closer to these sounds or move further away within the concert hall and consequently hear the performance more or less satisfactorily – that is, more or less clearly, with a fuller or a dampened sound. All this is possible only because the performance of the work is given to us in space at a determined point in the form of sound products developing in time.
>
> (Ingarden 1986, p.11)

Ingarden goes on to suggest that musical works are not spatially located; this "is why the very question "Where is [Chopin's] B Minor Sonata?" sounds so absurd" (Ingarden 1986, p.61). He goes on to clarify this point:

> In contrast to its specific performances the work of music possesses no defined spatial localization. No such localization is specified either by the created acts of the composer or by the score. Thus the work may be performed anywhere, and any spatial location of the performance inevitably tied to it is each time different [...].
>
> (Ingarden 1986, p.18)

We are not (yet) in a position to say whether acousmatic works occupy particular spatial locations. However, it is reasonable to suggest that acousmatic works and their instances are, at the very least, spatially distinct; acousmatic works may be instantiated in a wide variety of private listening situations, where only one listener is present (including both headphone listening and loudspeaker listening), and public listening situations, where multiple listeners may be present (as is common in concert halls or venues of a similar size)[46]. However,

[46] Henriksen provides a detailed breakdown of various listening situations (Henriksen 2002)

the work is not tied to any of these spatial locations and may, as a result, be instantiated in numerous different spaces at different points in time[47].

3.2 The Acousmatic Work: an Ontological Description

The previous section served to differentiate between acousmatic performances and the works that they instantiate. This section provides an answer to the following question: what *is* an acousmatic work? Three possible answers are presented and discussed; Section 3.2.1 considers the *medium* view, Section 3.2.2 considers the *class* view and Section 3.3.3 considers the *type* view. In all three sections an ontological hypothesis is introduced, explained and critiqued, before being discussed in relation to the acousmatic work[48].

3.2.1 The *Medium* View

The medium view offers the most intuitive answer to the ontological question posed above, for it assumes that an acousmatic work is little more than an encoded medium (such as a CD, DVD, length of magnetic tape or vinyl disc). In some respects, this view is entirely plausible; the medium is numerically, temporally and spatially distinct from the performances that derive from it and, further to this, there are precedents for this ontological view. For example, in *Tape composition: an artform in search of its metaphysics,* Linda Ferguson presents a version of the *medium* view (Ferguson 1983). We shall briefly consider Ferguson's argument.

Linda Ferguson's *medium* view is directed at a particular acousmatic tradition known as tape composition[49]. Ferguson argues that the works found

[47] This point becomes clearer in Section 3.2.3, in which acousmatic works are described as *abstract* formations.

[48] The ideas presented in this section are further elaborated in *Through Thick and Thin: the Ontology of Tape Music* (Stansbie 2010).

[49] Ferguson employs the term *tape composition*: "to mean those orderings of sounds which exist on magnetic tape (and generally made available through phonorecordings), selected, arranged, and manipulated by the composer, and reproducible at will through playback equipment" (Ferguson 1983, p.17). She goes on to offer elektronische musik and musique concrète as examples of tape composition traditions, identifying a range of practitioners involved in such

within this tradition are "commodities" (Ferguson 1983, p.23) and "products" (Ferguson 1983, p.23) and she goes on to suggest that: "the owner of the tape composition recording holds the genuine object" (Ferguson 1983, p.24). Thus, for Linda Ferguson, works of tape composition appear to be little more than lengths of encoded magnetic tape.

Ferguson arrives at the above conclusion following a lengthy discussion of the compositional methods and techniques employed in the creation of tape compositions, starting with a reference to *musique concrète*; like Schaeffer, Ferguson claims that the tape composer: "works in the concrete […] directly with the sonorous matter of his art" (Ferguson 1983, p.19). She goes on to note that the tape composer uses "lengths of tape" to manipulate the "physical reality of his object, as painters [and] sculptors […] do [with] their visible physical realities." (Ferguson 1983, p.19). At this stage, Ferguson's arguments are agreeable, since she is merely employing established terminology to describe some of the compositional processes and techniques employed in the creation of tape compositions. However, as her argument progresses, she moves away from a discussion of compositional processes, ultimately describing tape works as "particularized and concretized" entities (Ferguson 1983, p.20). At first, this claim appears to be a logical development of her earlier argument. However, there is a notable shift in emphasis; she is no longer referring to the processes or techniques employed during the compositional process but to the end product. In this context, the term *concrete* refers to the work itself, which Ferguson deems to be a length of magnetic tape.

One may note that Ferguson's argument is out of date; contemporary acousmatic composers rarely use magnetic tape during the creation of their works and, as a result, the physical object, along with the term *tape composition,* has virtually disappeared. Despite this, contemporary acousmatic composers continue to work directly with sound materials and, in order that they may do so, require some sort of sound recording or storage medium. Contemporary media (such as CDs, DVDs or computer hard-drives) may, as Robert Wilsmore

traditions whilst outlining some of the compositional techniques that they typically employ. One may describe tape composition as an acousmatic tradition.

recently pointed out, be far harder to describe as physical objects[50] (Wilsmore 2010, p.10). However, it may be possible to update Ferguson's argument and, with this mind, her *medium* view must be considered.[51]

One of the main problems with Ferguson's argument is the ease with which the tape compositions may be copied or transferred from the original medium to another; providing that some copy of it remains, one may destroy the original without destroying the work itself. This implies that the work and the medium are (like the work and the performance) numerically distinct. Ferguson may reject this argument, perhaps claiming that a new copy is simply a new work of art. However, this would imply, incorrectly, that composers generate new works each time their compositions are copied. With this in mind, it is perhaps sensible to agree with William Echard who, in *Subject to a Trace: The Virtuality of Recorded Music* claims that: "no particular medium in which a work might appear can be seen as identical with the work itself." (Echard 2008, p.29).

There is a further problem with Ferguson's argument that may be exposed by reference to an ontological theory proposed by Andrew Kania (Kania 2008), who claims that a work of art must be: "the primary focus of critical attention within a given artistic tradition" (Kania 2008, p.5). He demonstrates this point by discussing a particular paint-covered canvas:

> The Mona Lisa is a work of art, in part because it is a painting produced in the artistic tradition known as 'painting', while none of the sketches for the Mona Lisa is a work, since sketches are not a primary focus of critical attention in the painting tradition
>
> (Kania 2008, p.5)

[50] "We might in analogue times have lent some significance to the studio tapes that first held recordings of the artists in the studio, but the digital holds nothing so capable of becoming a material relic" (Wilsmore 2010, p.10).

[51] This point is compounded by the fact that Ferguson's medium view has been expressed (albeit with less vigour) elsewhere. For example, in 1976, James Urmson presented an ontological thesis in which works of tape music were shown to be closely related to works of painting on the grounds that they are both physical objects (Urmson 1976). A similar view is suggested by Levi-Strauss (1969), who compares works of musique concrète with works of painting, and Nicholas Wolterstorff, who notes that some works of music are created using magnetic tape rather than musical scores before suggesting that this distinction associates tape music with the plastic, concrete arts, resulting in music that is not for performance (Wolterstorff 1980).

In another publication, Kania uses his notion of critical attention to discuss musical scores, noting that a musical score contains a range of properties which the associated musical work necessarily lacks; scores have various visual and typographical properties whereas musical works have various sonic and musical properties (Kania 2005, p.36). The sonic, musical properties are more likely to be described as the primary focus of our critical attention within the artistic tradition of music and therefore the score and the work are necessarily distinct.

One may consider Linda Ferguson's discussion of tape composition in relation to Andrew Kania's critical attention theory. In doing so, one may find certain cases in which the length of magnetic tape, and therefore the encoded medium, fulfils a certain aesthetic role in relation to a work[52]. However, even in such cases, as rare as they may be, one cannot realistically entertain the idea that the medium is the *primary* focus of a listener's critical attention; no matter how visually stimulating the tape may (or may not) turn out to be, it is unlikely to occupy the *primary* focus of critical attention. With this in mind, it is reasonable to conclude that the medium and the work are distinct. As James Mooney pointed out, the medium is: "only ever a means to an end, rather than an end in itself." (Mooney 2005, p.11)[53].

3.2.2 The *Class* View

Some ontologists, often referred to as *nominalists*, claim that artworks can be identified with the group (known as a class or set) of their various instances or occurrences (Goodman 1969; Predelli 1995; 1999). Thus, a nominalist theorist would not identify a work of photography or music with a particular print or

[52] Simon Emmerson's *Spirit of '76* (1976) is an example of a work in which the tape fulfils a certain aesthetic role. Emmerson's piece, for flute and accelerating tape delay, involves a loop of tape placed on the stage which is gradually "eaten away" (Emmerson 2006) over the course of the work. Emmerson describes the audience's interactions with both the visual and the aural aspects of the composition: "The visual and aural reinforce each other. The piece starts quietly and the audience follows the slow progress of the tape spool and loop across the floor. The intensity begins to rise. The psychological tension becomes almost unbearable as the audience watches the tape reach physical tension and breaking point. How will the piece end? Will the tape break? The piece stops abruptly at that point" (Emmerson 2006, p.215).

[53] Ten Hoopen makes a similar point when discussing works of acousmatic music, claiming that the acousmatic work has a perfect material existence but claims that this objectivity becomes subjectivity as soon as the music is performed (Ten Hoopen 1997, p.14)

performance but with the group (or class) of their prints or performances. In this way, the nominalist marks a distinction between singular and multiple artworks; singular artworks are physical objects whereas multiple artworks are *classes* of physical objects (or events[54]). We shall briefly consider this class view before considering whether acousmatic works are simply classes of performances.

The class view seems relatively straightforward. However, the process of grouping physical objects into a class is hugely problematic; in order that they may be grouped, the members of a class must display some degree of conditional uniformity, yet the degree and nature of this uniformity is not necessarily self-evident. For example, one may expect a series of sculptures drawn from a single cast to be largely identical, since the casting process strives for instantial uniformity, but one cannot expect the performances of a musical work to be identical, since performances often involve a degree of interpretation that produces instantial novelty. As a result, it might be possible to identify a degree of conditional uniformity that holds between two cast sculptures but this becomes increasingly difficult when two musical performances are radically distinct[55].

With the above in mind, Nelson Goodman, a well-known nominalist theorist, sought to rationalise the degree and nature of conditional uniformity, using musical works as a case study. In *Languages of Art,* Goodman described a musical work as a: "class of performances" (Goodman 1969, p.210)[56]. He went on to suggest that the members of a given class will be grouped if (and only if) they *comply* with the instructions set out in an associated musical score. Thus, the members of a class must display some degree of conditional uniformity

[54] Some theorists have claimed that performances are not physical objects but events or processes (Forrester 2000; O'Callaghan 2007; 2009). Even so, performances are, as Kania points out, spatiotemporal entities and therefore: "in the spirit of the simple physical object hypothesis" (Kania 2005, p.37). The term *object* will be employed throughout the remainder of this chapter and should be taken to encompass performances and associated sonic instantiations.

[55] This problem becomes increasingly pronounced in cases where works are *open* (such as Stockhausen's *Klavierstücke XI* and Boulez's *Third Sonata for Piano*). The performances of these works may be radically distinct due to the: "considerable autonomy left to the individual performer in the way he chooses to play the work" (Eco 1984). A detailed discussion of open works may be found in Eco (1984).

[56] Unfortunately, Goodman devotes much of his attention to the relationship between performances and scores without any detailed discussion of the associated musical work. The same may be said about Stefano Predelli (1995; 1999), who developed a theory similar to Goodman. Predelli is primarily concerned with musical performances and scores and rarely discusses musical works.

which is dictated by the instructions provided by the composer. In this way, Goodman's score-compliance theory addresses the various problems associated with the classification process, clearly defining the degree and nature of conditional uniformity amongst the members of a musical work's performance class. However, it has drawn much criticism (Davies 2004, pp.40-41; Kania 2005, p.40; Goehr 2007, pp.13-43; Scruton 1999, p.112); although these criticisms are invariably heterogeneous[57], there are two central objections. Firstly, musical works are not always scored (and this is often the case with acousmatic works) and secondly, performances of works may contain mistakes:

> A famously problematic implication of meeting the perfect compliance condition is that any performance, however boring, satisfies the notational prescription so long as it has no mistakes. Contrarily, the most brilliant performance, if it has but one mistake, does not count as a performance of the work.
>
> (Goehr 2007, p.40)

Goehr goes on to suggest that Goodman's score-compliance view deviates from our established practices in the sense that performers and listeners accept a distinction between correct and incorrect performances of a work (Goehr 2007; Rohrbaugh 2005). With this in mind, Lydia Goehr, along with many of her peers, concludes that scored, instrumental works are not classes of performances (Davies 2004; Goehr 2007; Rohrbaugh 2005; Thomasson 2004; Urmson 1976; Wolterstorff 1980).

[57] Nicholas Wolterstorff argues that the various members of a set must exist simultaneously (1980, pp.49-50). However, he notes that there are very few musical works whose performances occur simultaneously, and as a result, the identification of works with sets of their performances is seemingly implausible. Urmson (1976) points out that the nominalist hypothesis does not account for works that remain, for whatever reason, uninstantiated; such works are either not (yet) works, since the set (or class) of their instances is non-existent, or, alternatively, uninstantiated works must share the same (empty) set. Stephen Davies (2004) raises another objection: "[...] the [nominalist] view seems to imply that Beethoven's Fifth Symphony is constantly growing larger as it receives more performances, yet 'growing larger' is not a predicate we would accept as applying to musical works." (Davies 2004, pp.41-42). Amie Thomasson (2004, p.8) makes a similar point, suggesting that the cancellation of particular performance would necessarily remove a member from the performance set; this would, according to nominalist logic, necessarily remove some aspect of the work. However, this is not, to echo Stephen Davies, a predicate that we would accept as applying to musical works (Davies 2004, pp.41-42). The cancellation of a performance would only affect that particular performance event (and presumably the audience that were hoping to attend the event) without affecting any aspect of the associated musical work.

The nominalist theory continues to be discussed by ontologists but only seems appropriate in cases where multiple artworks, such as cast sculptures and certain forms of printmaking, encourage instantial uniformity. Curiously, this leads Lydia Goehr to suggest that the nominalist approach may be suitable in cases where "electronic equipment" (Goehr 2007, p.32) has been used in the creation and dissemination of musical works. We shall briefly discuss Goehr's point and consider whether it may be applied to works of acousmatic music.

In *The Imaginary Museum of Musical Works: an Essay in the Philosophy of Music*, Lydia Goehr makes the following claim:

> […] with electronic equipment, one could create music of fixed values that would be unalterable in successive performances. We have a situation here in which the same electronic tape is played over and over again in each successive performance. And we can imagine the case of a computer programme where the output is identical in its constitutive attributes in successive performances. These kinds of programme or algorithm have been produced in recent years, and they serve to reinforce the emphasis on notation albeit somewhat more broadly viewed. This view of notation supports Goodman's theory.
>
> (Goehr 2007, pp.32-33)

In the above statement, Goehr appears to be suggesting that electronic equipment may be used to bring about instantial uniformity. If so, one may be able to identify some degree of conditional uniformity between the instances of a given work and this would enable one to group the instances into a class and thus refer to the class as a work. For Goehr, this appears to validate Goodman's class theory. Unfortunately, Goehr does not align her comments with any particular musical tradition, but it may be possible to describe acousmatic works as classes of instances, on the grounds that electronic equipment (broadly conceived) is used in the creation and dissemination of such works.

At first, Goehr's suggestion seems inherently problematic when applied to the acousmatic tradition; acousmatic works are rarely scored during the creative process and, since Goodman's compliance class is dependent upon the existence of a score, it would be extremely difficult (if not impossible) to determine which features must *comply* in order for a class to be created in the first place. Despite this, Goehr clearly believes that electronic equipment creates

instantial uniformity, which she describes using the terms *fixed, unalterable* and *identical,* and with this in mind, she presumably believes that one could establish a compliance class that is based upon something other than a score (Goehr 2007, pp.32-33). Despite this, it is extremely difficult to apply the terms *fixed, unalterable* and *identical* to acousmatic instances; as discussed in Chapter 1 (Section 1.3), the ostensible fixity of the encoded medium does not necessarily translate into fixed, unalterable or identical instances, largely due to the lack of decoding transparency and the acoustic influence of listening spaces.

With the above in mind, the nominalist view only seems appropriate in cases where works are created for playback, since instantial uniformity would be aesthetically desirable and instantial novelty (should it occur) would signal a flaw. Despite this, it would be strange to suggest that works for playback and works for performance are ontologically distinct. This point is invariably compounded by the fact that works for performance *may* be played back, and vice versa. Accordingly, we shall look elsewhere.

3.2.3 The *Type* View

Nominalist theories are often rejected in favour of some sort of realist hypothesis. There are numerous different realist approaches and, to avoid a lengthy comparative analysis[58], we shall focus upon the realist notion of *types* and *tokens*; these terms are introduced before being applied to works of acousmatic music.

In *Modern Philosophy: an Introduction and Survey,* Roger Scruton uses the terms *type* and *token*[59] to describe the Ford Cortina:

[58] Realists identify relatively subtle differences between properties, kinds, universals and types. Both Kania (2005) and Rohrbaugh (2005) claim that differences between the various realist accounts are extremely subtle. As a result, we will focus upon the notion of types since this is (arguably) the most popular realist theory.

[59] The terms *type* and *token* derive from Peirce's semantic distinction between words and occurrences of words (Peirce 1933, p.242); Peirce referred to the various occurrences of words as *tokens*, noting that these tokens must be occurrences *of* something, which he called a *type.* The following example helps to explain Peirce's type-token distinction: "consider the number of words in the Gertrude Stein line from her poem Sacred Emily on the page in front of the reader's eyes: Rose is a rose is a rose is a rose. In one sense of 'word' we may count three different words; in another sense we may count ten different words. C. S. Peirce […] called words in the first sense "types" and words in the second sense "tokens" (Wetzel 2006, p.1).

> If I refer to the Ford Cortina, I do not refer to one particular car, but to a type of car. The individual Cortinas are 'tokens' of this type.
>
> (Scruton 2004, p.84)

Scruton goes on to suggest that we discuss types (such as the Ford Cortina) as though identifying a particular physical object. However, he suggests that types are only really encountered and understood through their various tokens. This is because a type, unlike a token, is an abstract, generalised entity[60]:

> The Ford Cortina [...] is to be described and explained in terms of concrete processes in the spatio-temporal world. Nevertheless, there is no place where the Ford Cortina *is*. It remains aloof from the world of its tokens, just as numbers do.
>
> (Scruton 2004, pp.84-85)

With this in mind, Scruton suggests that types straddle a fundamental ontological divide between concrete and abstract modes of existence (Scruton 2004, p.84; 1999, p.104); types do not exist in the concrete, spatiotemporal world. However, they are encountered in, or through, their various concrete manifestations. Thus, the type: "is an abstract object, which itself bears the predicates of the individuals that exemplify it" (Scruton 1999, p.104).

Scruton's point is echoed by Richard Wollheim, who suggests that types enter into a close relationship with their various tokens and are, as a result, more intimately related than classes and their members (Wollheim 1980); classes are simply formed by grouping objects or entities in respect to some degree of assumed conditional uniformity whereas a token is only related to another token in so far as they both relate to the same type. Wollheim's explanation of this point is complex and therefore worth quoting at length:

[60] Like many in his field, Roger Scruton believes that some objects or entities have an abstract mode of existence: "[...] do we not also refer to and describe things like numbers, classes, possibilities and fictions? Numbers especially are the source of much philosophy [...] we give them names, and strive to discover the truth about them. Yet it is absurd to say that they exist in space and time: as though there were some place where the number nine could at last be encountered." (Scruton 2004, p.84)

> Let us introduce as a blanket expression for types [and] classes, [...] the term generic entity, and, as a blanket expression for those things which fall under them, the term element. Now we can say that the various generic entities can be distinguished according to the different ways or relationships in which they stand to their elements. These relationships can be arranged on a scale of intimacy or intrinsicality. At one end of the scale we find classes, where the relationship is at its most external or extrinsic: for a class is merely made of, or constituted by, its members which are extensionally conjoined to form it. The class of red things is simply a construct out of all those things which are (timelessly) red. [...] With types we find the relationship between the generic entity and its elements at its most intimate: for not merely is the type present in all its tokens [...] for much of the time we think and talk of the type as though it were itself a kind of token, though a peculiarly important or pre-eminent one. In many ways we treat the Red Flag as though it were a red flag (cf. 'We'll keep the Red Flag flying high').
>
> (Wollheim 1980, pp.75-76)

With the above in mind, Richard Wollheim goes on to develop a bespoke type-token hypothesis, describing works of ballet, dance, music, opera, photography, print-making, poetry and cast sculpture as *types* and their instances as *tokens* (Wollheim 1980). He starts by suggesting that artistic types derive from an act of human invention; these acts are heterogeneous, falling along a scale as described below:

> At one end of the scale, there is the case of a poem, which comes into being when certain words are set down on paper or perhaps, earlier still, when they are said over in the poet's head [...]. At the other end of the scale is an opera which comes into being when a certain set of instructions, i.e. the score, is written down, in accordance with which performances can be produced. As an intervening case we might note a film, of which different copies are made: or an etching or engraving, where different sheets are pulled from the same matrix, i.e. the plate.
>
> (Wollheim 1980, p.80)

Wollheim goes on to suggest that musical works sit alongside their operatic counterparts; they come into being when a set of instructions is written down in the form of a musical score in accordance with which performances can be produced. Despite this, Wollheim notes that the score is neither the type nor a token of the types. Instead, scores are *intermediary entities* located between a

type and its various tokens (Wollheim 1980, p80). The score enables the composer to clearly delineate key features or properties of the work (type) in accordance with which instances (tokens) of the work can be produced (Wollheim 1980, pp.79-80). Thus, by following the instructions set out in a musical score (the intermediary), performers may seek to instantiate works (types) through the act of performance (tokens).

Wollheim goes on to suggest that artistic types have various properties[61] that determine, at least in part, the nature of the type's tokens (Scruton 2004, p85). In some cases, types have a large number of properties and, as a result, their various tokens are characterised by instantial uniformity. In other cases, they have relatively few properties and, as a result, their various tokens will be characterised by instantial novelty. Thus: "[...] not every property that can be predicated of the former [a token] *ipso facto* belongs to the latter [a type]" (Wollheim 1980, p.82) and this implies that artistic types are (at least in some cases) schematic formations that may be instantiated in numerous different ways. At this point, the distinction between classes and types seems particularly relevant; the latter, unlike the former, can account for both instantial uniformity *and* instantial novelty, which Wollheim describes using the term *interpretation*:

> This point is generally covered by saying that in such cases there is essentially an element of interpretation, where for these purposes interpretation may be regarded as the production of a token that has properties in excess of those of the type
>
> (Wollheim 1980, p.82)

Wollheim's notion of types and tokens does have a relatively small number of well-known critics (Levinson 1990; Price 1982; Predelli 1995; Wolterstorff 1980)[62] and is, of course, merely a hypothesis. However, it has, in

[61] Different types will have different properties and, as a result, it is difficult to define this term without giving specific examples. For the moment, the following definition may serve to explain Wollheim's intentions (later on in this section, the term *properties* is explained in relation to works of scored, instrumental music): "Properties (also called 'attributes,' 'qualities,' 'features,' 'characteristics,' 'types') are those entities that can be predicated of things or, in other words, attributed to them. For example, if we say that that thing over there is an apple and is red, we are presumably attributing the properties red and apple to it." (Orilia and Swoyer 1999)

[62] A central criticism comes from Price and Predelli, who claim that types, as abstract entities, are incapable of causal interaction and, as a result, cannot be created or destroyed (Price 1982; Predelli 1995); this view, as explained by Rohrbaugh, is clearly at odds with our intuitions and

recent years, become something of an ontological paradigm, receiving substantial support from both philosophers and aestheticians who view it as the most plausible of the various ontological theories (Bender 1993; Davies 2004; Godlovitch 1998; Kania 2005; Kivy 1983; Rohrbaugh 2005; Scruton 1999; Thom 1993; Walton 1988; Webster 1974; Wollheim 1980). With this in mind, it seems to provide an ideal means of describing the relationship between acousmatic works and their instances. We shall briefly consider this point.

Acousmatic works are numerically, temporally and spatially distinct from their various performances and, further to this, are not easily described as encoded media or classes of performances. As a result, it seems reasonable to describe them as types that are encountered *in* or *through* their various performances which may be described as tokens. This observation requires one to accept that acousmatic works are *abstract* entities that have concrete manifestations. However, there is clearly a precedent for describing musical works in this way and, as a result, it seems entirely justifiable.

One could extend the above description by suggesting that acousmatic types have various properties that determine (at least in part) the details of their various tokens. However, we know (following the discussion in Chapter 1) that these properties may be transformed by the performance space and (following the discussion in Chapter 2) diffused in concert; with this in mind, one may suggest that acousmatic tokens have some properties in excess of those of the associated type.

One may extend the above description even further by describing the encoded medium as an *intermediary* entity that is located between an acousmatic type and its tokens. Thus, by decoding an encoded medium (the intermediary) one may produce performances (tokens) of acousmatic works (types). This conclusion draws acousmatic works into the dominant ontological paradigm and provides a clear framework through which works and their instances may be considered and discussed. However, it leaves many questions unanswered; namely, what exactly *are* the properties of an acousmatic type?

expectations: "our [artistic] practices seem centrally to embed the thoughts that artists create their works and that these works can be destroyed" (Rohrbaugh 2005, p.8). Peter Kivy has rejected the views of Price and Predelli, arguing that art works are not created but discovered (Kivy 1993).

How do they underpin the properties of their tokens? Do some works have more properties than others? Do performances of the same work always have the same properties? The following section considers these, and related, questions (Section 3.3). In doing so, it fleshes out the type-theory expressed above, provides a more detailed discussion of acousmatic types and tokens and paves the way for a detailed discussion of performance interpretation and authenticity in the following two chapters (Chapters 4 and 5).

3.3 Acousmatic Types and Tokens

The previous section aligned acousmatic works and their performances with Richard Wollheim's type-token hypothesis (Wollheim 1980). This section considers the relations between acousmatic types and tokens. The discussion is complicated by the fact that types are only ever encountered *in* or *through* their various tokens and, as a result, it is often difficult to assess whether properties belonging to the latter also belong to the former. With this in mind, we shall start by discussing scored, instrumental types and tokens; this serves to further clarify types, tokens and the relations that hold between them (Section 3.3.1). The subsequent section considers whether it possible to differentiate between acousmatic types and tokens using the same approach (Section 3.3.2). This section (and the chapter) concludes with the following claim: the distinction between acousmatic types and their tokens is extremely opaque and, as a result, acousmatic performances must involve acts of *interpretation*; this becomes the subject of the subsequent chapter (Chapter 4).

3.3.1 Sound Structures

Most type-theorists describe works of scored, instrumental music as types of *sound structures* and their performances as tokens (Bender 1993; Davies 2004; Kivy 1983; Scruton 1994; 1999; Walton 1988; Webster 1974). These theorists generally agree that sound structures are schematic, indeterminate formations that may be instantiated in numerous different ways (largely through the practice of performance *interpretation*). However, since sound structures (types) are only

ever encountered through their various performances (tokens), the schematic nature of the former may be obscured by the concrete details of the latter. This leads to various disagreements about which aspects of the structure (or, more accurately, which aspects of the structure's *properties*) belong to the work and which belong exclusively to the performance. We shall briefly consider the main point(s) of contention.

William Webster, Peter Kivy and Roger Scruton believe that the central properties of a sound structure can be identified by looking at a musical score (Kivy 1983; Scruton 1999; Webster 1974). This leads them to suggest that sound structures are timbre-less sequences of notes and intervals; for these theorists, timbral properties are only determined during a performance and thus belong to tokens but not types (Kivy 1983; Scruton 1997; Webster 1974). Other theorists, such as John Bender (1993), Stan Godlovitch (1998) and Kendal Walton (1988) disagree, noting musical works presuppose a performance practice that is only loosely captured in the score and, as a result, one can only consider the score as representative of a given sound structure if one also considers the context in which the score was produced and the associated kind of performance practice to which the score is directed (Bender 1993; Godlovitch 1998; Walton 1988). This leads them to conclude that timbral details *are* determined at the point of composition and are, as a result, properties of sound structures (type) and not merely properties of a given performances. This point is supported by Stephen Davies, a well-known type-theorist who has made a significant contribution to the sound structure debate; we shall briefly consider Davies' contribution, since many of his terms and ideas are employed later on in this thesis (Davies 2004).

In *Musical Works and Performances: a Philosophical Exploration,* Stephen Davies suggests that sound structures are schematic types, but argues that the degree of schematisation inherent in their structures will depend upon the nature of the work in question (Davies 2004). He goes on to suggest that musical works can be placed on a continuum with *thin* works at one end and *thick* works at the other[63]:

[63] The terms *thick* and *thin* appear to reference Clifford Geertz's well known cultural anthropological study (Geertz 1973). Geertz used the term *thick* to refer to the various possible

> If it is thin, [...] most of the qualities of a performance are aspects of the performer's interpretation, not of the work as such. The thinner they are, the freer is the performer to control aspects of the performance. Pieces specified only as a melody and chord sequence are thin. Some tin pan alley songs are of this kind. For them, the player creates the larger structure of the performance by deciding on the number of repeats, variations, elaborations, links and the like [...] By contrast, if the work is thick, a great many of the properties heard in a performance are crucial to its identity and must be reproduced in a fully faithful rendition of the work. The thicker the work, the more the composer controls the sonic detail of its accurate instances. Igor Stravinsky's *The Rite of Spring* (1913) is a thick work by comparison with Mozart's *Divertimento in D, K. 136*. Thicker yet is Edgard Varèse's *Déserts* (1954) for tape, wind, percussion, and piano, because the contribution made by the tape is both essential to the work's identity and extremely specific.[64]
>
> (Davies 2004, p.20)

Davies goes on to suggest that musical scores may provide a great deal of information about the relevant features of a given sound structure. However, he points out that one can only describe a sound structure as *thick* or *thin* by identifying the social, cultural and historical context in which they were created and the associated performance practice that they presuppose (Davies 2004, p.43). In other words: "no theory is true of all musical works" (Davies 2004, p.43) since sound structures invariably differ in the "extend, depth, and saturation" (Davies 2004, p.26) of their various properties.

Davies' thick-thin thesis seems responsive to the practices of both composers and performers and, further to this, provides a means of articulating distinctions that hold between different types of sound structures. As a result, it

reasons behind a human action, especially when used in forms of communication. Geertz provides a thick description when considering the difference between a facial twitch and a wink; the former may be involuntary and communicate very little whereas the latter "is communicating, and indeed communicating in a quite precise and special way" (Geertz 1973, p.5).

[64] Davies' thick-thin thesis does not seek to quantify the various sounds occurring during a given performance: "performances of thin works are as replete with acoustic information as are those of thick works, but, for performances of thin works, more of this information is referable to the performance than to the work" (Davies 2004, p.20). Thus, large orchestral works are not necessarily any thicker than solo piano works.

has the advantage of resolving many of the various disagreements relating to the discussion of types and their tokens:

> The distinction [between thick and thin works] has the potential to defuse some apparent disagreement between type-theorists about which features of works are relevant to their identity, for in many cases, the answer will simply vary with the thickness of the works at issue.
>
> (Rohrbaugh 2005, p.7)

The sound structure debate exemplifies one of the major issues with the type-token hypothesis, namely: it is difficult to identify properties of types since they are always encountered through their tokens. With this in mind, it is little surprise to find that most type theorists are concerned with scored, instrumental works; a score simplifies the debate, since it enables one to identify certain aspects of the work's sound structure and thus differentiate between those features (or properties) belonging to the work and those added in performance. Despite this, the focus upon musical scores only creates further problems; as stated above, most musical works presuppose a performance practice which is only loosely captured in the score (Davies 2004, p.111) and, as a result, the discussion about sound structures often becomes a discussion about scores and the various ways in which they should (or should not) be read.

3.3.2 Sound Sculptures

This section considers acousmatic types. It considers the problem of differentiating between acousmatic types and their tokens but suggests that the former *underdetermine* the concrete details of the latter and are therefore characterised by degrees of schematic, indeterminacy (as described above).

One *may* describe acousmatic types as sound structures. However, this description comes into immediate conflict with the views of most type-theorists, who reserve this term for works of scored, instrumental music. This should not necessarily dissuade one from using the term elsewhere. Indeed, a broader application of the term could only have positive consequences, drawing other forms of music into in ongoing (and somewhat parochial) sound structure debate

would be of benefit to the wider ontological community[65]. Even so, the following alternative is proposed: acousmatic works are types of *sound sculptures.* We shall briefly discuss this proposal.

The term *sound sculpture* serves to highlight an intimate connection that holds between the compositional methods employed by acousmatic composers and their resulting works; as discussed in Chapter 1, acousmatic composers often refer to their creative acts using terms associated with the plastic arts, such as painting and sculpture, and, given Pierre Schaeffer's use of the term *concrète* and the implied reversal of traditional compositional methods, there is clearly a sense in which acousmatic works are sculptural[66]. Despite this, the term *sound sculpture* is *not* supposed to signal a return to medium view (as discussed in Section 3.2.1); sound sculptures are *types* and must be understood in relation to the type-token hypothesis. Further to this, the term *sound sculpture* is *not* supposed to highlight a major ontological distinction that holds between acousmatic works and other musical works. Sound sculptures and sound structures are largely synonymous; the sole difference relates to the compositional methods employed by the composer (as outlined in Section 1.1) which are often described in terms of crafting, shaping and sculpting sounds in the composition studio. With this in mind, we shall employ the term *sound sculpture* in the following discussion, consider what properties sound sculptures might have and assess how these properties relate to their various instances.

Like all types, acousmatic types are only encountered *in* or *through* their various tokens. As a result, attempts to describe the properties of such types are invariably problematic; as discussed above, it is often difficult to know whether the properties of tokens are also properties of types and, in the acousmatic tradition, this is compounded by the fact that acousmatic composers rarely issue

[65] Some ontologists have openly expressed their disapproval of scope, depth and breadth of ontological discourse. For example, the opening lines of the preface of Davies' *Musical Works and Performances: a Philosophical Study* read: "In this book, I try to avoid the narrow parochialism that so far has distinguished musical aesthetics. Most philosophers of music (myself included) have concentrated on musical works to exclusion of performances, on the listener's perspective to the exclusion of the composer's and the performer's, and on Western classical music to the exclusion both of popular form of Western music and of non-Western varieties." (Davies 2004, preface).

[66] Further to this, the act of sound diffusion is often described in terms of sculpture. For example, in *Living Electronic Music,* Simon Emmerson suggested that sound diffusion is: "limited to matters of forming and sculpting a pre-formed sound sequence 'into' a space" (Emmerson 2007a, p.31).

instructions or scores. This makes the identification of a type's properties extremely difficult, since one cannot adhere to the methods employed by the vast majority of type theorists. Despite this, there are several logical observations that one may make; these are outlined below.

Chapter 1 provided an overview of the compositional processes involved in the creation of acousmatic works. With this in mind, it is reasonable to suggest that acousmatic sound sculptures are ontologically thick; the composer works directly with sounds during the act of composition and, following the type-theory advocated by Stephen Davies, this implies that the various properties heard in a performance are also properties of the associated work. This observation is akin to Davies' discussion of Varèse's *Déserts* (1954) for tape, wind, percussion, and piano – in this case, the tape part is extremely detailed and, as a result, the composer has been able to control the sonic detail of its accurate instances.

The above point implies that acousmatic sound sculptures are located at the extreme end of Davies' thick-thin continuum. This is invariably true, since many of the various properties heard in an acousmatic performance are also properties of the associated acousmatic work. Despite this, acousmatic composers, particularly those familiar with the practice of sound diffusion, often consider the various possibilities that diffusion presents during the creation of their works. In such cases, composers make compositional decisions with these various possibilities in mind and, as a result, their works *presuppose* acts of sound diffusion. The degree and nature of these presupposed acts will vary depending upon the work in question and, further to this, may be more or less crystallised in mind of the composer. However, in all such cases, works that are created with diffusion in mind must be slightly thinner than suggested above, since they underdetermine the concrete details of their various instances.

The above point is supported by Jonty Harrison who, in *Sound, space, sculpture: some thoughts on the 'what', 'how' and 'why' of sound diffusion*, makes the following claim:

> [Acousmatic music] grows, mutates, evolves, permitting a certain fluidity and flexibility in the final aural manifestation of the sound (along the lines of Varèse's thinking on the

> development of crystals), thereby permitting diffusion the possibility of further expanding the underlying argument.
>
> (Harrison 1999b, p.125)

Harrison goes on to clarify this point and although he does use the ontological terms *underdetermine* or *thin,* he clearly has something similar in mind:

> The simple fact is: much electroacoustic music, particularly that in the musique concrète and acousmatic tradition is intended to be diffused, has the variability of performance underlying its aesthetic base.
>
> (Harrison 1999b, p.124)

In this context, the term *variability* is particularly significant, since it implies that acousmatic works are not replete, determinate sound sculptures, but schematic, indeterminate formations that may be concretised in a variety of different ways. Harrison makes a similar point, suggesting that acousmatic works are incomplete, awaiting acts of diffusion[67].

With the above in mind, the following point seems entirely plausible: acousmatic works (or at the very least, acousmatic works that have been created with diffusion in mind) appear to be ontologically similar to their scored, instrumental counterparts; both encourage a degree of variability, presuppose diverse instantial acts and are, as a result, invariably characterised by a schematic, indeterminate structure. At this stage, one may recall the views of Ferguson (1983), Davies (2004) and Godlovitch (1998) (as discussed in Chapter 1) and (hopefully) recognise the full significance of their ontological claims; these theorists are not merely suggesting that acousmatic *sounds* are fixed they are, in effect, suggesting that acousmatic *works* are fixed, thus implying that they lack the schematic, indeterminacies that are required for works to be performed. We are now in a position to fully reject their claims.

[67] In a recent talk, Harrison questioned whether: "[...] what is stored on tape/disk is 'incomplete' [...]" (Harrison 2011). Elsewhere, he has suggested that diffusion is an extension of the compositional process (Harrison 1999b, p.125; 1999a, p.1). A similar view has been proposed by Simon Emmerson, who claims that acousmatic works "are studio created yet only 'completed in performance'" (Emmerson 2007, p.31). This idea has been proposed in relation to works of scored, instrumental music. For example, Susanne Langer claims that scored works are incomplete and that the performance "[...] is the completion of a musical work" (Langer 1953, p.138). A similar point has been raised by Linda Dusman (1994, p.135).

This above conclusion holds for stereo, multichannel and stem-based works if (and only if) these works have "the variability of performance underlying [their] aesthetic base" (Harrison 1999b, p.124). However, this does not mean that stereo, multichannel and stem-based works are at the same level of ontological thickness and, further to this, one cannot assume that the various works located *within* these broad categories are ontologically uniform. We shall briefly consider these two points[68].

In some cases, stereo works presuppose numerous, diverse acts of sound diffusion, whereas in other cases, works may presuppose a few, uniform acts; this may lead one to assume that the former are ontologically thinner than the latter. However, this is not necessarily correct; the notion of thick and thin works refers to the degree of autonomy left to the performer. Even so, the fact that stereo works potentially admit anything from a few, uniform acts to the numerous and diverse may lead one to assume that stereo works are not necessarily at the same level of ontological thickness; the degree of variability between the work and the instantiation of the work may be considerable and thus some stereo works are thinner than others. Accordingly, one might expect to find that some works diffuse more readily than others and that some performance situations allow for a broader range of expressive agential acts than others. This point is taken up in the following chapter.

Given the limitations associated with multichannel sound diffusion (discussed above), it is reasonable to assume that multichannel works are ontologically thicker than their stereo counterparts; composers have fewer interpretative options to consider during the creation of multichannel works and this often leads them to create pieces that are for playback rather than performance. This point has been raised by Jonty Harrison who, in his discussion of an eight-channel piece called *Streams* (1999), notes that the work: "*does* present more problems in performance than my stereo works because I have, despite myself, a more rigid image in my mind of how it should sound!" (Harrison 2000, p.5). Despite this, it remains *possible* to diffuse multichannel works and, as a result, it is equally possible for some multichannel works to be

[68] The following discussion generalises about the potential degrees of indeterminacy that *may* hold between works and their instead. This discussion is contextualised later on with a discussion of the associated portfolio of original compositions (Chapter 4).

slightly thinner than their instances. Even so, the degree of variability between the work and its instantiation are extremely limited and, as a result, the vast majority of multichannel works remain at the extreme end of Davies' thick-thin continuum.

Stem-based works are often ontologically thinner than both stereo and multichannel works, since the former potentially admit a degree of variation that is absent from the latter. The details of each stem will have been determined by the composer. However, the way that these stems are distributed or configured will only be fully determined, or realised, during the act of diffusion. For Harrison and Wilson, this often means that the diffuser is required to make certain choices about how to separate and distribute the various stems:

> [...] some choices (or at least their specific realisation) are deferred at least until the performance situation is known. The 'finished' work is necessarily in some sense not quite finished. This is arguably even truer with stem-based composition than is the case with stereo diffusion.
>
> (Harrison and Wilson 2010, pp.245-246)

The above statement may be restated in relation to the notion of thick and thin works; stem-based works are often thinner than their stereo counterparts, since they offer the diffuser a range of options that can only be acted upon once the performance situation is known. Despite this, stem-based works may not be quite as thin as they first appear; the various ways in which stems may be distributed or configured during the act of diffusion is invariably dictated, at least in part, by the affordances and constraints of the diffusion system employed. Since relatively few diffusion systems facilitate the presentation of stem-based works, it is reasonable to assume that composers create works *for* specific diffusion systems, thus pre-empting specific instantial acts. As a result, stem-based works often appear to be very thin but can often be, in reality, quite thick.

The various observations introduced above served to align acousmatic works with Wollheim's notion of types and tokens (Wollheim 1980) and Davies' thick-thin continuum (Davies 2004). Acousmatic works were described as thick types of sound sculptures. However, these sculptures (potentially) vary

in the extent, depth and saturation of their various properties. Although this conclusion seems conceptually functional, it is predicated upon an assumption about what a composer may (or may not) have considered during the act of composition; since there is no score, it remains extremely difficult to assess whether a work is thick, thin or situated between extremes. The next chapter, which considers this problem from the perspective of the performer, suggests that acousmatic performances must involve an act of interpretation (Chapter 4).

3.4 Summary

This lengthy chapter considered the ontological relations that hold between acousmatic performances and acousmatic works. It started by identifying various numerical, temporal and spatial distinctions that separate them, before clarifying these distinctions in relation to Wollheim's type-token hypothesis (Wollheim 1980). Acousmatic works were described as types of sound sculptures and their performances were described as tokens of these types. However, the following problem was identified; acousmatic types are only ever encountered *in* or *through* their various instances and, as a result, it is extremely difficult to identify whether the properties of the latter are also properties of the former. It is reasonable to assume that acousmatic works may have fewer properties than their performances, and this implies that they are sometimes ontologically thin. However, whilst this assumption may be conceptually functional, it creates problems for the performer; the following chapter considers some of the various ways in which performers deal with these problems and is therefore concerned with the notion of performance *interpretation* (Chapter 4).

Chapter 4: Interpretations

This chapter is divided into three main sections. Section 4.1 focuses upon interpretations of works. It starts by suggesting that performers are often *required* to interpret works, before considering some of the various ways in which interpretation is formulated. The ensuing discussion focuses upon interpretations of *sonic behaviours*, *references* and their associated *structural functions* and provides a series of examples drawn from the associated portfolio of original acousmatic compositions. Section 4.2 surveys some of the various contextual constraints that (potentially) affect the interpretative act. These constraints, which relate to performance spaces, diffusion systems and audience positions, typically require the performer to adjust their interpretative ideals to account for both works *and* performance contexts. Section 4.3 outlines some of the various ways in which interpretative skills are developed, refined and regulated. The ideas presented in this section follow on from (and conclude) the discussion of performance skills (introduced in Section 2.3). Taken as a whole, the three sections within this chapter present an idealised ontological account of performance interpretation, foregrounding the interpretative decisions that performers make, and further clarifying the relations that hold between acousmatic works and acousmatic performances. Ultimately, acousmatic performances do not merely involve the instantiation of works, but instantiations *and* interpretations.

4.1 The Interpretative Ideal

The previous chapter described acousmatic works as types of sound sculptures. It went on to suggest that these types (often) presuppose acts of sound diffusion and are, as a result, indeterminate formations that are ontologically thinner than their various instances. Despite this, indeterminacies are notoriously opaque; acousmatic types are only ever encountered in or through their various tokens, and this makes it very difficult to assess whether the properties of the latter are also properties of the former. This section considers this problem from the

perspective of the performer and thus highlights the need for interpretations of works.

The acousmatic performer has no clear method for assessing whether a work is ontologically thick or thin and, without access to the composer, no way of knowing which acts of sound diffusion were imagined during the compositional process. This observation may go some way to explain why acousmatic composers often double up as acousmatic performers; the various problems associated with the identification of schematic, indeterminacies becomes far less problematic if the composer simply assumes the role of performer. Despite this, there are obviously practical limitations; composers cannot necessarily attend each performance of a given work and must, in some cases, consent to their works being performed by others. Accordingly, the problem under discussion often remains unresolved.

Some acousmatic composers provide performance instructions in the form of a diffusion score. In most cases, a diffusion score provides: (1) a visual representation of a given piece, often in the form of a spectrograph, waveform, or hand/computer-drawn visual representation, and (2) an indication of specific acts of diffusion (as intended by the composer) often in the form of a diagram indicating speaker positions and relative levels (Pasoulas 2008; Williams 1993). In most cases, time is represented on a horizontal axis, spectrum on a vertical axis and bespoke figures and symbols are explained in an associated key[69].

Diffusion scores enable acousmatic composers to make certain performance-related intentions prescriptive. However, diffusion scores present the following practical disadvantages:

[69] In *Sound Composition*, Trevor Wishart provides numerous examples of his own diffusion scores (Wishart 2012). They are separated into *diffusion score blanks* and *worked examples of diffusion scores*. The former, which include time along a horizontal axis, include numerous drawings and written descriptions of sound events but leave a blank section which is to be filled in by the performer: "[…] diffusion instructions for the performance are written onto this diffusion-blank. These specific instructions are determined during rehearsal of the piece in the space, and act as a guide or reminder for the performance proper" (Wishart 2012, p.160). The latter, which are derived from the former, show how Wishart has completed diffusion-blanks for specific past performances.

1) There is no established notation system and, as a result, diffusion scores are invariably characterised by extreme heterogeneity, which makes them difficult to read and follow.

2) The composer does not necessarily know where and when a specific piece will be performed and, unless diffusion scores are created in advance of known performances, they are invariably tailored to ideal, as opposed to real, contexts. This invariably limits their functionality, since the composer is often required to prescribe relatively generalised acts of diffusion, so as to avoid prescribing acts that are unachievable.

3) As a consequence of the previous two points, the performer is almost always required to interpret diffusion scores. This adds a layer of variability to the performance process that diffusion scores would ideally strive to negate.

In the future, standardised notation may be developed, performance contexts could become relatively uniform and, as a result, diffusion scores could become more useful. At present, this is not the case and, as a result, diffusion scores have limited functionality and are rarely used by acousmatic composers and performers.

Composers may clarify (some of) their performance-related intentions by issuing multiple versions of their works. For example, in a recent talk, Jonty Harrison explained that he created two versions of a stereo acousmatic work called *Hot Air* (1995); Harrison explained the difference between these versions as follows:

> I knew that the work would be premiered on the GRM's Acousmonium on the deep stage of the Salle Olivier Messiaen. The piece contains a very long 'Mediterranean nightscape' section which recedes very slowly into the distance, to the vanishing point [...]. I knew that I would be able to sustain this structural effect in diffusion, but when I came to release the work on CD, I shortened this section, feeling it was too long for

> a personal or domestic listening context, without the benefits of diffusion and real loudspeakers in distant positions.
>
> (Harrison 2011, p.6)

The difference between the two versions of *Hot Air*, may reveal *certain* aspects of Harrison's performance-related intentions and may, as a result, serve as a model for a performance. Despite this, it is reasonable to assume than many of his intentions remain unclear; the durational difference between the two versions is relatively insignificant and, without Harrison's accompanying explanation, fairly obscure. Unless further, more significant differences hold between the numerous versions of a work, one must assume that these differences are of relatively little use to a performer.

In the absence of any further clarification from the composer, the problem of identifying (and dealing with) a work's schematic, indeterminacies will be passed over to the performer, who is thus required to make his or her own decisions about the presentation of the work. These decisions, which are two-fold, may be summarised as follows: 1) the performer must decide which aspects of the work are most likely to be indeterminate, and 2) the performer must decide how to deal with those (actual or assumed) indeterminacies during the act of performance[70]. The outcome of this two-fold decision-making process may be described as an *interpretative ideal.*

Interpretative ideals are often formulated in a composition studio (or other (ostensibly[71]) transparent listening environment), in which the performer may focus upon particular points in a given work (often by listening to sections rather than the whole), produce bespoke notes or instructions (perhaps in the form of a diffusion score or aide-mémoire that will serve to locate and identify key moments in the work that they can follow during the act of diffusion) and, crucially, make their various decisions relative to the two-fold decision-making

[70] This observation raises a number of questions that are addressed in the following chapter (Chapter 5), namely: Are the performer's decisions necessarily appropriate or accurate? What happens if the performer's decisions do not represent the intentions of the composer? Can the performer's decisions result in inauthentic performances of works?

[71] As suggested in Section 1.3, listening environments, which are never transparent, may offer the *illusion* of transparency, especially when they have been designed with this in mind. Such environments are ideal for formulating interpretations of works, since they enable the performer to encounter a token (albeit a playback) divorced from the acoustic influence of larger spaces.

process outlined above. We shall now consider some of the various factors that inform and direct the outcome of this decision-making process[72].

The two-fold decision-making process outlined above may lead some readers to imagine that the interpretative process is entirely subjective and without boundaries or restrictions. However, this is not correct; interpretations must serve the work that is to be performed. This point has been raised by Walls:

> We value imagination and originality in performers, but recognise that (normally) this serves the music they perform, helping to illuminate its character or make palpable its emotional content.
>
> (Walls 2006, p.17)

Walls' comment refers to scored, instrumental music. However, it is equally relevant to works of acousmatic music; the acousmatic performer must make interpretative decisions in response to specific nature and character of acousmatic works.

The above point may seem reasonably straightforward. However, acousmatic works are characterised by extreme heterogeneity and, as a result, interpretations are, as Reid points out "[...] resistant to prescriptive recommendations" (Reid 2006, pp.106-107). Even so, three (albeit extremely broad) tendencies may be identified; acousmatic composers often formulate their interpretations in response to sonic *behaviours* (Section 4.1.1)*, references* (Section 4.1.2) and their *structural functions* (Section 4.1.3). To demonstrate this point, we shall consider some of the behaviours, references and structural functions found in the acousmatic works included in the associated portfolio of original acousmatic compositions. This approach enables us to undertake a detailed discussion of particular sonic materials and draw some conclusions about the kinds of agential acts that a performer *may* employ relative to such

[72] The next section considers a range of contextual constraints that often require performers to adjust their interpretative ideals to account for the specific diffusion system being used, the acoustic nature of the concert hall, and the size and placement of the listening public, amongst others (Section 4.2).

materials[73]. The individual works are discussed in more detail in Appendix III: Composing *for* Performance. This appendix contextualises the various ideas presented elsewhere, highlights some of the ways in which these ideas have developed during the investigation, and demonstrates how a detailed understanding of the ontology of the acousmatic musical performance may inform, and even direct, the compositional process.

4.1.1 Behaviours (in *Early Morning*)

Acousmatic performers often formulate their interpretations in response to the sonic behaviours (or spectromorphological[74] behaviours) found within specific works. To demonstrate this point, we shall discuss some of the various behaviours found within *Early Morning* (a stereo acousmatic work composed in 2006), consider how a performer may develop an interpretative ideal with these behaviours in mind, and draw some broad conclusions that may apply elsewhere.

Early Morning is characterised by a sequence of broad gestural behaviours that become increasingly active as the piece develops. Although gestures are typically concerned with a sense of human, physical activity (Smalley 1997, p.111), those found in *Early Morning* have been heavily transformed, are disconnected from the original sound-source and, as a result, physical activities may only be imagined or assumed by the listener. Despite this, all of the gestural materials within the piece serve to propel the music forwards in ways that are characteristic of gestural materials found elsewhere:

> In electroacoustic music the scale of gestural impetus is also variable, from the smallest attack-morphology to the broad sweep of a much longer gesture, continuous in its motion and flexible in its pacing. The notion of gesture as a forming principle is concerned with propelling time forwards, with

[73] The discussion foregrounds the author's own interpretative ideals and, since the author is also the composer, it is far from neutral. Despite this, the various ideas presented below highlight the manifold interpretative possibilities that potentially arise during the interpretative act and broad conclusions serve to identify common tendencies and/or techniques.

[74] Denis Smalley invented the term *spectromorphology* to refer to the spectral content of a sound and the way that such content shapes, or morphs, over time (Smalley 1986; 1997). The term is used, and explained, throughout this section.

> moving away from one goal towards the next goal in the structure – the energy of motion expressed through spectral and morphological change. Gestural music, then, is governed by a sense of forward motion, of linearity, of narrativity.
>
> (Smalley 1997, p.113)

The various gestures found within *Early Morning* are separated by a series of textures. Textural materials, unlike their gestural counterparts, rarely foreground human, physical activity and, as a result, the listener's attention is directed towards intrinsic or internal details. This point has been explained by Denis Smalley:

> If gestures are weak, if they become too stretched out in time, or if they become too slowly evolving, we lose the human physicality. We seem to cross a blurred border between events on a human scale and events on a more worldly, environmental scale. At the same time there is a change of listening focus – the slower the directed, gestural impetus, the more the ear seeks to concentrate on inner details (insofar as they exist). A music which is primarily textural, then, concentrates on internal activity at the expense of forward impetus.
>
> (Smalley 1997, pp.113-114)

Accordingly, one may say that gestural and textural materials differ in so far as they direct the listener's attention towards external activities that propel time forwards (gestures) and internal activities that create the impression of relative stasis (textures).

In *Early Morning*, a *gesture-texture interplay* defines the global structure of the piece; gestures are always followed by textures which are, in turn, followed by further gestures. This creates a sequence of clear contrasts that may be seen below:

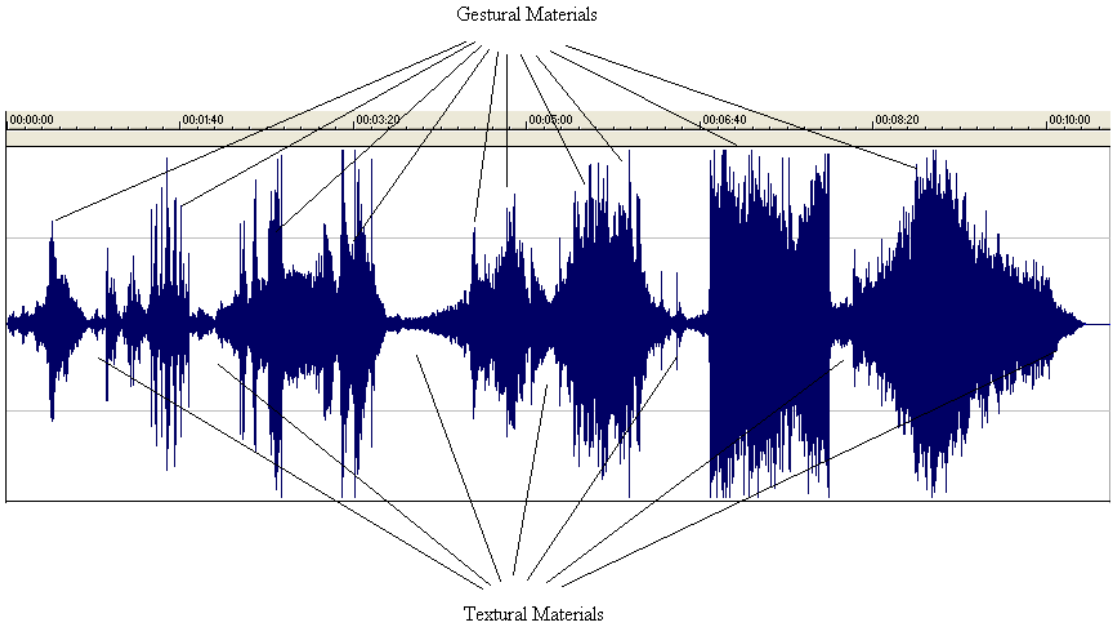


Figure 6: Gestures and Textures in *Early Morning*

Performers often develop their interpretative ideals relative to the gestural and textural materials found within acousmatic works. In most cases, this involves the use of expressive agential acts to: 1) further dramatise gestural activities (and thus enhance the impression of physicality and forward motion), and 2) further spatialise textural materials (to enhance their environmental, internal activities). This approach responds to specific musical materials, highlighting and developing the behaviours of such materials within a given performance space. Despite this, many interpretative options remain available; performers may further dramatise and/or spatialise materials in numerous different ways and, as a result, their interpretative ideals benefit from a closer examination of specific behaviours within specific works. To explain this point, we shall consider three examples drawn from *Early Morning*; example 1 (0'00" – 1'08") and example 2 (5'25" – 5'50") concern gestural materials and example 3 (3'40" – 4'00") concerns textural materials.

Example 1 (0'00" – 1'08")

This short section is taken from the introduction to *Early Morning*, and presents two main gestures, highlighted below:

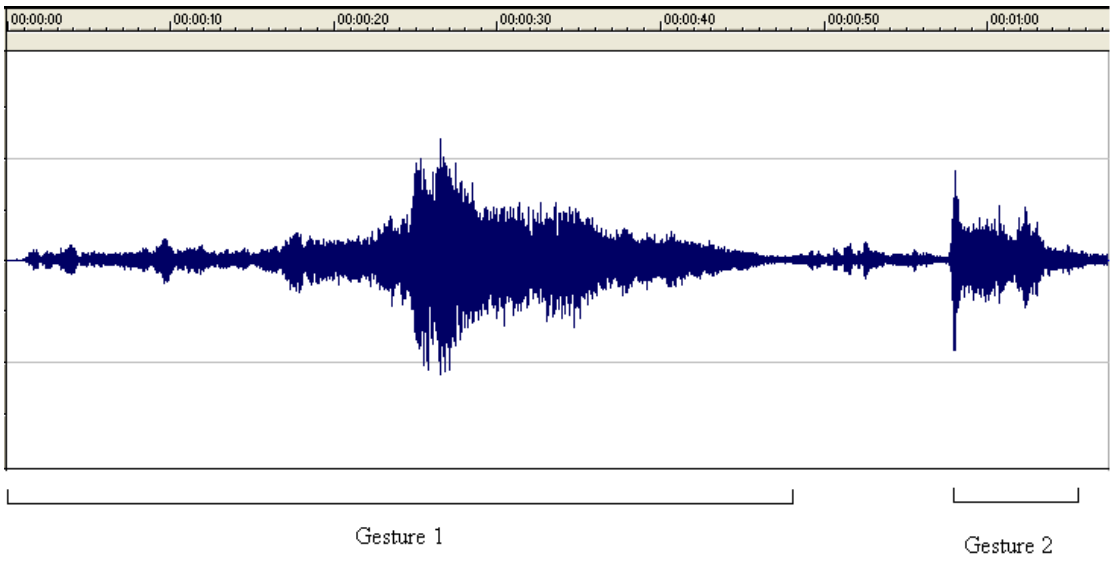


Figure 7: Two gestures in *Early Morning* (0'00" – 1'08")

The first gesture emerges gradually, reaches a climax (in terms of both amplitude and spectral density) at 0'26", before slowly disappearing at 0'51". This gradual morphological shape is, on the whole, characterised by a low-frequency spectrum that lowers in pitch as the climax is reached and then sustains its pitched content before disappearing. The spectrum lacks clarity throughout. Although primarily gestural, there is no clear sense of human physicality. Instead, the broad gestural contour suggests activity on an environmental scale, and is therefore almost textural; the lack of both high-frequency content and spectral clarity suggests that the gesture is situated in an open space, perhaps emerging from, and retreating into, the distance.

An acousmatic performer is likely to employ corrective agential acts to ensure that the broad morphological shape is not marginalised by the listening environment. However, the performer would probably wish to highlight the environmental activity, and this may be achieved in number of ways. For example, the performer may employ a pair of distant loudspeakers to highlight the lack of proximate, high-frequency content whilst creating a sense of panorama. Alternatively, they may decide to situate the gesture at numerous distant points within the listening space to create a sense of omnipresence whilst highlighting the lack of proximate sounds. Either way, it is likely that the

performer would attempt to move the sound from a distant position to a more proximate position and back again to ensure that the gesture *emerges* into (and *disappears* from) the performance space. In doing so, the performer would be responding to the implied gestural behaviour (as outlined above).

The second gesture, which is pre-empted by a series of short inharmonic bell-like sounds, starts with a high-frequency resonant attack (0'57) and is immediately followed by a cluster of additional resonant attacks. These materials, which are characterised by a short, high-frequency spectrum and an attack-decay morphology, clearly contrast with the first gesture (described above), since they do not appear to emerge or depart and, given that the spectral content of these materials is much clearer, they are suggestive of a proximate (as opposed to distal) space, perhaps being located somewhat nearer to the listener[75]. With this in mind, the performer is likely to use expressive agential acts to situate those materials closer to the audience or, if this is not possible, raise the amplitude on a particular pair (say, the main pair) to create the impression of proximity. Once again, this approach serves to foreground gestural behaviours. However, it would also serve to highlight a contrast between the opening gesture (described above) and the second gesture.

Example 2 (5'25" – 5'50")

This short section from the middle of *Early Morning* brings together a range of highly gestural materials encountered elsewhere in the piece. The listener may be able to identify and recognise a range of specific gestures. However, they tussle for dominance within this short phrase, and the resulting mosaic of materials is spectrally saturated (approaching noise), and extremely active. Despite this, high-frequency sounds become increasingly prominent, gradually rising in pitch until a climax is reached at 5'47". The phrase serves to remind the listener of the various materials that have been encountered thus far and it presupposes the spectrally saturated gestural phrase that follows (7'36" – 7'54").

[75] The terms *proximate space* and *distal space* derive from Smalley (2007). The former is described as "The area of perspectival space closest to the listener's vantage point in a particular listening context" (Smalley 2007, p.56) and the latter is described as "The area of perspectival space farthest from the listener's vantage point in a particular listening context" (Smalley 2007, p.55).

As with the previous example, the performer will probably seek to foreground the gestural behaviours found within this short section. However, given the broad range of (simultaneous and sequential) behaviours and the degree of spectral saturation, the various materials encountered within this section seem particularly suited to a broad and active diffusion around the concert space. Thus, the performer will probably set a general level using a wide range of loudspeakers within the array, before rapidly increasing and decreasing the amount of signal being sent to the various different loudspeakers. This approach may enable the performer to create the impression that the individual gestural materials are acting independently, displace gestural behaviours throughout the performance space, and further dramatise the activity that unfolds. The performer will probably adjust this interpretative approach following the climax (at 5'47") to account for the sudden change in the level of activity.

Example 3 (3'40" – 4'00")

This short textural section is situated between two highly gestural phrases and serves as a point of contrast. The texture is not suggestive of any particular physical activity and remains relatively static (in terms of spectral content and morphological shaping) for the duration of the section. Accordingly, it neither arrives nor departs, and does not suggest any particular movement or behaviour that the performer may follow during the act of performance. Clusters of extremely quiet high-frequency bell-like materials may be heard, but these are subsumed into a prominent mid-frequency, sustained texture. This texture may (like all of the various textural materials found within *Early Morning*) require a substantially different approach to the gestural materials outlined in the previous two examples. The performer will probably underline the impression of stasis by setting a loudspeaker level across the array and this will probably remain unchanged for remainder of the section, the lack of activity further enhancing the contrast between the gestures heard immediately before and after.

This section focused upon *Early Morning* – a particular acousmatic work. However, it has highlighted several ways in which performers *may*

develop their interpretative ideals when considering other works. It suggested that performers can further dramatise gestural materials and further spatialise textural materials. However, this broad approach, which needs to be modified to account for specific gestures and textures, requires the performer to interpret the various ways in which sound materials behave, and make various decisions about the expressive agential acts will best serve those behaviours. In short, performers may formulate their interpretative ideals relative to the particular behaviours found within particular pieces.

4.1.2 References (in *Isthmus*)

In *Spectromorphology: explaining sound shapes,* Denis Smalley makes the following claim:

> A spectromorphological approach cannot deal adequately with electroacoustic music which is very strongly anecdotal or programmatic, that is, music where a very wide palette of sonic references may be employed – recordings of cultural events and behaviour, musical quotation and pastiche, and so on. In this type of electroacoustic music, meaning is closely allied to recognising the sources, identifying with them, knowing which context they have been drawn from, and reinterpreting their meaning in their new musical context. Such music is therefore *transcontextual* or *intertextual*.
>
> (Smalley 1997, pp.109-110)

Smalley goes on to suggest that such references *may* be described in terms of their spectromorphological behaviours and he notes that spectromorphological qualities often help to qualify transcontextual messages (Smalley 1997, p.110). Despite this, a spectromorphological approach concentrates on the *intrinsic* features of works often to the exclusion of any *extrinsic* features that highlight a range of experiences existing outside of the context of the work (Smalley 1997, pp.109-110).

With the above in mind, Smalley invented the term *source-bonding,* which he describes as: “the *natural* tendency to relate sounds to supposed sources and causes, and to relate sounds to each other because they appear to

have shared or associated origins" (Smalley 1997, p.110). Source-bondings occur when a listener links something from within a given work (an intrinsic feature) to the sounding world outside (an extrinsic feature). Smalley notes that intrinsic-to-extrinsic links might be actual or imagined, shared amongst groups of listeners or highly personalised, and may arise: "[…] because of the variety and ambiguity of its materials, because of its reliance on the motion of colourful spectral energies, its emphasis on the acousmatic, and not least through its exploration of spatial perspective" (Smalley 1997, p.110). The final point in this statement is particularly significant; source-bonded sounds, like non-source-bonded sounds, are carriers of spatial information, but the former, unlike the latter, carry spatial information that is relative to an extrinsic source and/or cause. Smalley raises this point in *Space-form and the acousmatic image*, using the term *source-bonded space*[76]. He goes to explain how source-bonded spaces are established:

> Although I will intuitively pick up various cues of position in space, particularly the relationship between proximate and distal space, these cues are not the prime space-bearers. It is the behaviour of the source-causes themselves that transmits the main spatial information. I know from experience about the spectromorphologies created by frogs, rivers, cicadas, birds and cars, and how they behave, but it is not so much that they act in an already existing space. Rather, they produce space through their action. These spaces did not exist before the source-causes created them. Source-causes produce space. Source-bonded spaces are significant in the context of any acousmatic musical work, not just in those works where clearly defined source bonding occurs, but also in musical contexts where I imagine or even invent possible source bonds […].
>
> (Smalley 2007, p.38)

Acousmatic performers *may* formulate their interpretations in response to particular source-bonded sounds. In doing so, they do not necessarily ignore the spectromorphological behaviours of such sounds, but they foreground source-bonded references and spatial perspectives relative to such behaviours. For example, imagine an acousmatic work that includes the sounds of a street

[76] Smalley explains this term as follows: "The spatial zone and mental image produced by, or inferred from, a sounding source and its cause (if there is one). The space carries with it an image of the activity that produces it." (Smalley 2007, p.56).

market. From a spectromorphological perspective, such a work is likely to include a range of highly gestural spectromorphological behaviours (footsteps, voices, cars passing across the stereo image, and so on). The performer *may* decide to highlight the gestural behaviours of these sounds through the use of expressive agential acts. However, it is likely that the performer will foreground the source-bonded spatial perspectives relative to such gestures, perhaps using agential acts to create an immersive state that envelops the listener in the sounds of the market place or, alternatively, highlighting the perspectival nature of the source-bonded references relative to the listener's position (frontal, for example). In doing so, the performer is, in effect, formulating an interpretation that serves the various sonic references embedded in the fabric of a given work. To clarify this point, we shall consider the various references encountered within *Isthmus* (a stereo acousmatic work composed in 2005), consider how the performer may deal with such references, and draw some broad conclusions that may apply elsewhere.

The entire sound-world of *Isthmus* is derived from a series of recordings of a string quartet (comprising two violins, a viola and a cello). The quartet was recorded in two different ways. Firstly, it was recorded using a stereo-microphone technique[77]; this captured the relative spatial positions of the four string instruments (from the left side of the stereo image to the right, violin 1, violin 2, viola, cello). Secondly, the individual instruments were recorded by placing microphones very close to the bodies of the four instruments; this served to capture microscopic spectral and morphological details that would not be captured by the first technique. The instrumental performers played a range of notated fragments and phrases and used various extended techniques, often following verbal instructions from the composer. The finished work, which is divided into three movements, explores Denis Smalley's notion of gestural surrogacy, as described below.

Smalley introduces the notion of gestural surrogacy as follows:

[77] A coincident-pair of directional microphones were situated in front of the ensemble, angled to the extreme left and right.

> The listener's experience of listening to instruments is a cultural conditioning process based on years of (unconscious) audiovisual training. A knowledge of sounding gesture is therefore culturally very strongly imbedded. This cannot be ignored and denied when we come to electroacoustic music. It is particularly important for acousmatic music where the sources and causes of sound-making become remote or detached from known, directly experienced physical gesture and sounding sources. The process of increasing remoteness I refer to as *gestural surrogacy*.
>
> (Smalley 1997, p.112)

He goes on to describe four levels of gestural surrogacy which chart the process of detachment outlined above. He starts by describing *first-order surrogacy*, suggesting that this level is: "concerned with sonic object use in work and play prior to any 'instrumentalisation' or incorporation into a musical activity or structure. It is here that musical potential begins to be recognised and explored" (Smalley 1997, p.112). He goes on to suggests that *second-order surrogacy* involves traditional instrumental gestures in which recognisable performance skill has been used to develop musical materials. Thus, acousmatic pieces which include recognisable instrumental recordings will be regarded as second order. *Third-order surrogacy* occurs when a gesture is inferred or imagined; the nature of the spectromorphological behaviours creates some uncertainty as to the source or cause of the sound. Finally, *remote surrogacy* occurs when sources and causes are completely unknown and all remaining vestiges of human agency have vanished.

The three movements in *Isthmus* explore the notion of gestural surrogacy. The first movement begins with recordings of the string quartet and is therefore concerned with second-order surrogate sounds; these materials are clearly source-bonded and, as a result, the listener is able to hear the various string instruments in their relative spatial positions within the stereo image. Some limited processing serves to elongate certain gestural materials, but references to the sources, and the space in which these sources were recorded, are neither disguised nor removed, remaining apparent throughout. The second movement traces a path from second-order surrogacy to third-order surrogacy. The materials presented at the opening of this movement are clearly source-bonded. However, they are gradually transformed (using a range of sound

transformation processes, including stretching, reversing, filtering, pitch-shifting, spectral morphing and warping, amongst others) to disguise the origins of the sounds, thus disrupt source-bondings and source-bonded spaces. Despite this, the resulting sound materials remain (for the most part) highly gestural, albeit in the realm of third-order surrogacy, until the very end of the movement, where sounds approach remote surrogacy. At this stage, the spectral content is clearly derived from the original string materials but it is extremely difficult to identify any form of human agency and there are no markers of source-bonded space. The third movement is derived from the same set of instrumental source sounds. However, the sources are no longer recognisable, having undergone substantial stretching, filtering and spectral smearing. The sound-world is largely characterised by textural materials, with the occasional gestural swell or burst remaining in the realm of remote gestural surrogacy.

A performer would (hopefully) seek to foreground the source-bonded gestural materials and spaces in the first movement, perhaps by positioning the stereo image in front of the listener (using either the main stereo pair or the main and wide stereo pair) to create a perspectival space in which the various instruments are situated in front of the listener relative to their assumed real-world position and context, as shown in the diagram below.

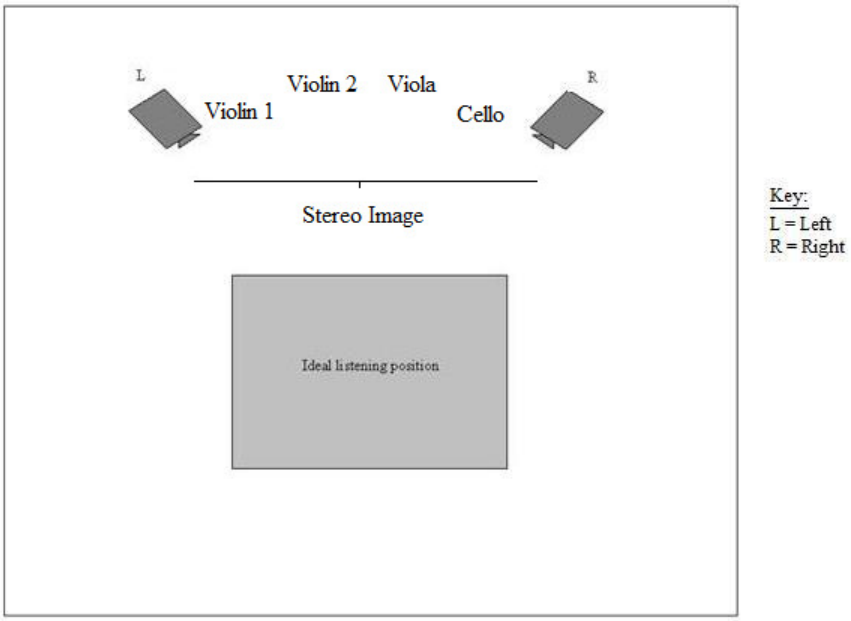


Figure 8: Instrumental positions in *Isthmus*

This approach would seem particular suitable, given the source-bonded nature of the materials and the real-world spaces that those materials appear to inhabit. However, there are further reasons to advocate this approach; the performer will (hopefully) want to use expressive agential acts to highlight the gradual development (throughout the piece) from second-order surrogacy to remote surrogacy. By situating the source-bonded sounds in front of the audience, the performer is able to root those sources within the listening space and, as they are gradually disguised, the performer may move away from this root, thus leaving the source-bonded spaces behind to mirror the gradual process of increasing remoteness. Thus, the performer is likely to concern themselves with the referential nature of the sound materials at the start of the piece before responding to spectromorphological behaviours as the piece develops. To demonstrate this point, we shall consider how a performer might approach a section from the second movement (0'00" – 0'46").

The section begins with a series of second-order surrogate instrumental gestures. The performer is likely to situate these gestural materials in front of the listener relative to their assumed real-world position and context (as described above). Between 0'25" and 0'27", a sudden rise in amplitude serves to trigger a series of manipulated instrumental sounds. These sounds are source-bonded. However, they have clearly undergone some form of transformation (largely through pitch-shifting and reversing). At this stage, the various instruments no longer occupy their original spatial positions and the gestural sounds begin the gradual process of moving from second-order surrogacy through to third-order surrogacy.

The performer is likely to highlight the transition described above, moving out from the frontal position established at the opening of the movement towards an exploration of the performance space. Even so, source-bondings remain intact and, as a result, the performer would probably attempt a gradual transition that is consistent with the gradual process of transformation. The various gestures are extremely active and, as a result, they suit further dramatisation. Accordingly, the performer may retain some vestige of source-

bonded space through the use of frontal loudspeakers, but may still employ agential acts to follow the spectromorphological behaviours of the transformed sounds.

With the above in mind, it seems reasonable to suggest that performers develop their interpretative ideals relative to specific source-bonded references, and that such references *may* take priority over spectromorphological behaviours. This point is most notable in cases where source-bonded spaces are of particular significance within a given piece; expressive agential acts that spatialise or dramatise source-bonded sounds in unusual or unexpected ways potentially negate or destroy the spatial references that are embedded within the work.

The above point seems reasonable. However, performers cannot consider individual source-bonded sounds aside from the musical context in which they are situated, since composers may deliberately situate such sounds in a non-real-world context and this (potentially) requires consideration during the formulation of an interpretation. To demonstrate this point, we shall consider Trevor Wishart's notion of the *sound landscape*, as discussed in *On Sonic Art* (Wishart 2002, pp.129-161), and suggest alternative ways in which performers may interpret source-bonded sounds.

Trevor Wishart uses the term *landscape* to describe some of the various ways in which sounds are suggestive of physical spaces (both real and imaginary). For example, in a section called *Landscape: the disposition of sound-objects in space* Wishart considers some of the ways in which specific sounds serve to *define* a physical space. He starts with the following thought-experiment which serves to define a (perceptually) real landscape:

> Imagine for a moment that we have established the acoustic space of a forest (width represented by the spread across a pair of stereo speakers, depth represented by decreasing amplitude and high-frequency components and increasing reverberation) then position the sounds of various birds and animals within this space. These sound-sources may be static, individual sound-sources may move laterally or in and out of 'depth' or the entire group of sound-sources may move through the acoustic space. All of these are at least capable of perception as real landscapes.
>
> (Wishart 2002, p.146)

Wishart goes on to suggest that one could replace sounds of birds and animals with arbitrary sonic objects and, by a gradual process of substitution, arrive at a different kind of landscape: "The disposition of the objects remains realistic (in the sense that we retain the image of the acoustic space of a 'forest') yet the sound-sources are not real in any sense of the word. Here we have the first example of an imaginary landscape of the type *unreal-objects/real-space*" (Wishart 2002, p.146).

The thought-experiment continues with an inversion of the *unreal-objects/real-space* type, to describe a *real-objects/unreal-space* type; Wishart suggests that one may retain the original sounds of birds and animals but assign arbitrary amplitudes, filters and degrees of reverberation. Following this, he describes a *surreal* imaginary landscape, which brings together normally unrelated sound objects in the virtual space created by loudspeakers. Wishart suggests that this approach (which would be a type of *real-objects/real-space*) has parallels with the technique of surrealist painting in which unrelated visual objects may be related on the virtual space of the canvas (Wishart 2002, p.146).

The discussion of landscapes serves to demonstrate some of various ways in which composers may employ source-bonded sounds and spaces. With this in mind, it is reasonable to suggest that performers should not simply present source-bonded sounds relative to (actual or imagined) source-bonded spaces. Rather, performers must consider and interpret the musical context in which these sounds are located. For example, a performer may use a range of expressive agential acts so that real objects (as encountered in a surreal landscape) appear to move and behave in usual ways; this approach may serve to enhance the surreal nature of a given landscape, further expressing the improbable positioning of unrelated objects in a given context.

In conclusion, source-bonded sounds must be considered relative to the musical context; in some cases, performers may foreground references to real-world sounds, by simulating (and even enhancing) their real-world spatial character. In other cases, performers may cause source-bonded sounds to behave in unusual ways, using acts of sound diffusion to displace or disrupt listener

expectations. In both cases, performers are not merely responding to the spectromorphological behaviours of sounds and, as a result, it is necessary to mark a distinction between the formulation of interpretations relative to spectromorphologies and sonic references, as found within source-bonded and landscape-based contexts.

4.1.3 Structural Functions (in *Parenthesis* and *Point of Departure*)

The previous two sections considered some of the various ways in which performers may formulate their interpretative ideals in response to particular sonic behaviours (Section 4.1.1) and references (Section 4.1.2). This section considers how behaviours and references *function* within the global structure of works. The following point is presented and defended: acousmatic performers are often required to adjust their interpretative ideals in order to foreground the *structural functions* of particular materials. To demonstrate this point, we shall employ some of the various terms and ideas found within the theory of functional analysis of acousmatic music, developed by Stéphane Roy (2000, cited in Stewart 2007) and use these terms to discuss *Parenthesis* (a stereo acousmatic work composed in 2008) and *Point of Departure* (a stereo acousmatic work composed in 2009). In both cases, an interpretative ideal is presented and some broad conclusions are reached[78]. We start by introducing the notion of functional analysis.

Stéphane Roy's lengthy theory of functional analysis serves to codify the contextual roles (or functions) enjoyed by sound events, or units, in a given musical structure (Roy 2000, cited in Stewart 2007). Roy offers forty-five bespoke terms that enable one to describe the structural functions of a given event or unit. These terms are subdivided into four broad categories. The first category (*Orientation Functions*) is reserved for musical events that delineate the musical structure in terms of their temporal relations with preceding or

[78] As discussed below, structural functions are characterised by extreme heterogeneity. As a result, this section considers two acousmatic pieces, thus enabling the ensuing discussion to cover a wider range of interpretative possibilities.

succeeding events (such as *introductions*, *conclusions*, *transitions*, *interruptions*, sounds that appears to *trigger* another sounds, amongst others). The second category (*Stratification Functions*) is reserved for musical events that occur simultaneously and the various terms (such as *foreground*, *background*, *support* and *accompaniment*) serve to highlight the degree of prominence at a given moment in time. The third category (*Process Functions*) is reserved for sound events that follow a directed temporal process (such as *accelerations* and *decelerations*, *accumulations* and *dispersions*, *intensification* and *attenuation* with respect to dynamic, spectral or melodic progression, amongst others). The fourth category (*Rhetorical Functions*) is reserved for musical events that enter into a discursive relationship with other musical events (such as a *statement* and *reminder*, and a *call* and *response*) alongside events that redirect the listener's attention from one musical event to another (such as a *parenthesis* – an event which interrupts the progress of another event without suggesting a new direction or development, *deflections* – events which interrupt the progress of another event whilst suggesting a new direction, *retention* – a silence, or near silence, that interrupts a unit of high tension to create a degree of expectation for listeners, amongst others).

Performers do not necessarily consider the various terms outlined above. However, it is likely that they will formulate their interpretations relative to the structural functions of particular materials[79]. To demonstrate this point, we shall discuss some of the various structural functions of musical events in *Parenthesis* and *Point of Departure.* The discussion of *Parenthesis* will foreground rhetorical functions and the discussion of *Point of Departure* will foreground process functions. We shall not discuss orientation functions or stratification functions in much detail, since performers often deal with introductions, conclusions, foregrounded and backgrounded sounds relative to their spectromorphological behaviours and/or their sonic references; this approach has been discussed above (Section 4.1.1 and Section 4.1.2).

[79] For the purpose of this investigation, we require some way of discussing these functions, hence the use of Roy's terminology.

Rhetorical Functions in *Parenthesis*

Parenthesis is characterised by granular noise – a term used by Denis Smalley to describe "sea, water textures, wind, static interference, granular friction between rubbed and scraped materials, fracturing materials (e.g. stone) [...]" (Smalley 1997, p.120). There are no intended source-bonded sounds. However, listeners are likely to bond certain sound materials with extrinsic sources and references (such as those described by Smalley) and/or identify familiar sound transformations/processes (such as granulation, wave-set distortion, bit-depth reduction, amongst others). In this respect, the piece encourages technological listening – a term used by Smalley to describe situation in which "[...] a listener 'perceives' the technology or technique behind the music [...]" (Smalley 1997, p.109).

As with previous pieces, the sound-world of *Parenthesis* is characterised by a gesture-texture interplay; gestural materials are extremely active (involving a range of glitch-like fragments, iterations, grains and pulses) and the textural materials are clearly derived from their gestural counterparts. With this in mind, the performer is likely to formulate an interpretative ideal relative to the spectromorphological behaviours found within the piece, perhaps using the approach advocated in Section 4.1.1 (one might expect the gestural materials to be further dramatised and the textural materials to be further spatialised, thus highlighting the contrast that holds between them). In this section, we consider some of the structural functions of these gestures and textures and suggest ways in which they might inform the interpretative act.

The opening of *Parenthesis* (0'00" – 2'44") is divided into two broad phrases. The first phrase begins with a gestural cluster of noise-based, attack-decay spectromorphologies (0'05" – 0'12"). This is immediately followed by a textural interlude, characterised by granular noise (0'12" – 0'42"), and then an *affirmation* of the opening gesture. Borrowed from Stéphane Roy, the term *affirmation* refers to a restatement of an event or unit in which one or more aspects (such as the dynamic profile and/or spectral content) is intensified, creating the impression that the phrase or section has concluded (Roy 2000, cited in Stewart 2007, p.95). In this case, the affirmation is substantially longer

(it involves an additional series of noise-based gestural clusters), the dynamic profile is slightly expanded and spectral range increased (largely through added lower-frequency content). As Roy suggests, this implies that the first phrase (from 0'05" – 0'56") has concluded.

The second phrase begins with an abrupt and unexpected noise-based, attack-decay event that functions as a *trigger* – "A unit that abruptly introduces another unit. Differs from an Introduction in that it requires no particular context and typically introduces new units without preparation" (Roy 2000, cited in Stewart 2007, p.93). The trigger introduces a second phrase that is an expanded version of the first; a series of short granular articulations are followed by a granular texture ultimately concluding with a further affirmation of the opening gesture. In this case, the affirmation is significantly expanded in terms of duration, dynamic range and spectral content. Once again, this serves to conclude the phrase. However, the various expansions create the impression of a much broader conclusion that relates to both the first *and* second phrases. The various terms used above are mapped onto the waveform shown below:

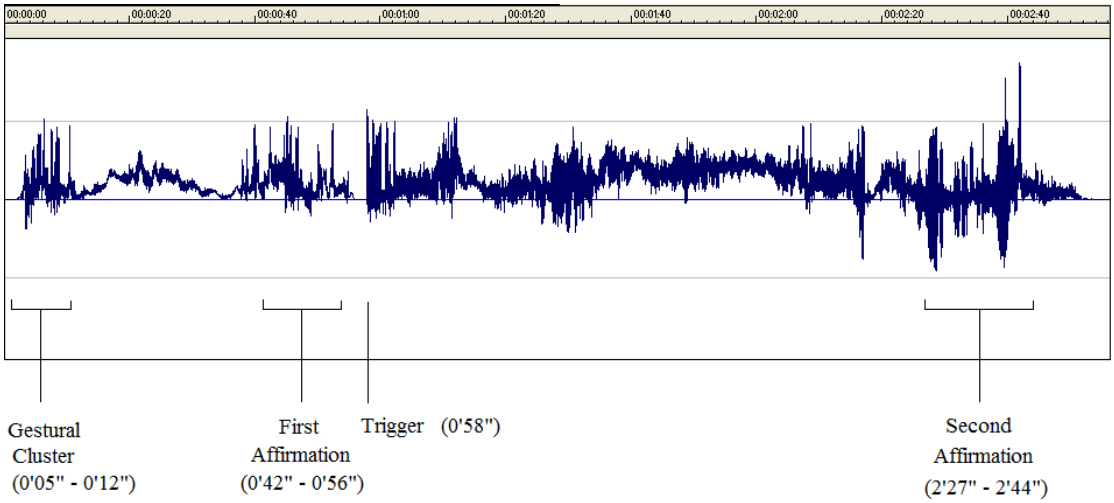


Figure 9: Affirmations in *Parenthesis*

The performer is likely to consider the opening gesture, subsequent affirmation, trigger and final affirmation when formulating an interpretation of the work; these various points are clearly significant within the structure of the work and, unless they are given due attention in performance, the performer will

fail to communicate the structural functions of these materials to the listener. We shall briefly consider this point.

It is likely, given the highly gestural nature of the opening materials, that the performer will employ a range of agential acts to further dramatise their various behaviours. However, the performer must also consider the fact that these materials (and their behaviours) reappear in the form of affirmations in which certain features are intensified. With this in mind, one would expect the agential acts employed during the opening to be sufficiently restrained so as to allow for a further intensification during both the first affirmation and the second affirmation. For example, the performer may present the opening materials across the loudspeaker array at a given level, begin to dramatise sounds (and raise levels) across the array during the first affirmation (to mirror the increased behavioural activity) and further dramatise sounds (and raise levels) during the second affirmation (once again, to mirror the expanded duration, dynamic range and spectral content). This is, of course, only one way in which the performer may interpret these materials. However, it serves to demonstrate the following point: the performer may be primarily interested in spectromorphological behaviours. However, the performer must also consider how these behaviours are dealt with throughout the piece and adjust their interpretative ideals accordingly.

The second affirmation (in the example above) is, given its expanded duration, dynamic profile and spectral content, highly prominent within the global structure of *Parenthesis*, serving to conclude the first major phase of the work. Accordingly, when similar materials appear later on in the piece they have structural significance. To explain this significance, we shall refer to the second affirmation as a *statement* and subsequent occurrences as *reminders*. These terms are borrowed from Roy: "A Statement is a perceptually prominent presentation of a musical object; the Reminder is a restatement of the same, often separated from the Statement by a significant lapse of time. The Reminder need not be prominent, and may be fragmented or transformed, but recalls by timbral similarity the Statement" (Roy 2000, cited in Stewart 2007, p.94). The initial statement and subsequently reminders are shown in the figure below:

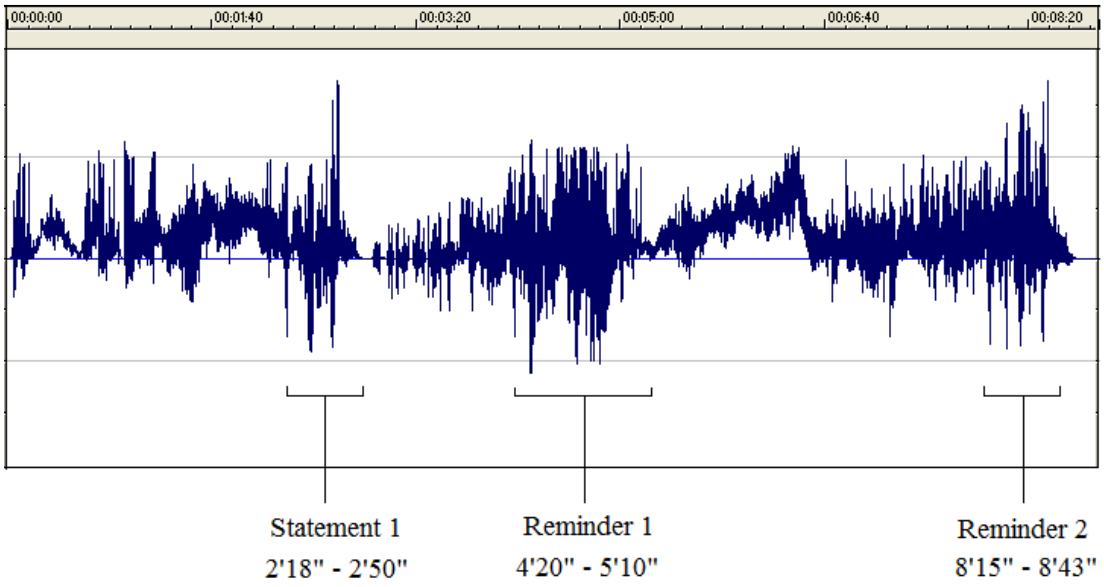


Figure 10: Statements and Reminders in *Parenthesis*

In this example, Reminder 1 differs from an affirmation in so far as it does not simply repeat statement 1, but presents certain spectral and morphological features *drawn from* statement 1; these materials are explored, re-presented and merged with additional spectral materials (in particular a low-frequency organic spectromorphology that contrast the associated noise-based gestures) and are therefore presented in a different context. As a result, Statement 1 and Reminder 1 have different structural functions; Statement 1 functions as a conclusion whereas Reminder 1, being drawn from the same stock of materials, *implies* that a conclusion is imminent, but this implication is not realised. Instead, the materials continue to develop, ultimately merging into a noise-based texture without an obvious conclusion or termination. Accordingly, Reminder 1 functions as a *prolongation*; a term used by Roy to describe an event that has develops into a stable state that allows the tension of the preceding section to dissipate (Roy 2000, cited in Stewart 2007, p.93). The same set of materials is encountered again at the end of the piece; Reminder 2 serves to re-contextualise many of the various materials heard elsewhere and, although most of these materials are fragmented, reprocessed and dynamically active, they have a similar structural function to Statement 1, with both serving as conclusions.

As with the various affirmations described above, the performer will (hopefully) address Statement 1 and Reminders 1 and 2 when formulating an interpretative ideal; all three mark highly significant structural points in the work and, as a result, must be considered by the performer. The performer is, of course, likely to interpret the spectromorphological behaviours found at these points in the piece. However, one might expect to find that Statement 1 and Reminder 2 are presented in very similar ways (since both function as conclusions) and that Reminder 1 is presented very differently (thus drawing attention to its *prolongation* function). For example, the performer may decide to diffuse Statement 1 and Reminder 2 by employing longitudinal movements (as discussed in Section 2.2.2.1) between the front and the back of the concert hall. They may establish a clear contrast when diffusing Reminder 1 by using various lateral movements.

Process Functions in *Point of Departure*

In addition to the rhetorical functions described above, performers may develop their interpretative ideals relative to various process functions found within works. To demonstrate this point, we shall consider some of the process functions within *Point of Departure,* the longest piece in the associated portfolio of original acousmatic compositions, and draw some conclusions that may apply elsewhere.

Stéphane Roy's numerous process functions are assigned to events that follow a directed temporal process, each with an opposite corresponding to its temporal reversal (Roy 2000, cited in Stewart 2007, p.14). For example, Roy describes the process of *accumulation* (and *dispersion* as its corresponding opposite) as: "A gradual increase (respectively, decrease) in density within a unit whose constituents, specifically numerous tiny impulses, are fused by the listener to form a coherent state or unit." (Roy 2000, cited in Stewart 2007, p.94). Two accumulation processes may be found within *Point of Departure*, as discussed below.

The opening of the piece charts a lengthy accumulation starting at 0'00" and ending at 6'00". The accumulation is two-fold, involving both a spectral

root[80], which gradually builds in terms of density and amplitude, and a collection of tiny granular impulses, which slowly fuse into a dense spectral mass. As the accumulation develops, the spectral root and the granular impulses appear to merge, reaching a point of spectral saturation. At this stage, the gradual process of accumulation concludes, and the spectral mass is gradually filtered into a coherent, unified whole. There are no obvious points at which the spectral root and granular impulses merge; the process of *accumulation* takes place over substantial duration and there are no clear markers dividing the resulting form.

A performer may wish to develop an interpretative ideal that responds to the various spectromorphological behaviours found within this section of the piece. However, they must also foreground the broad process of accumulation, since this is clearly significant within the global structure. This (potentially) leads to a conflict of interest; on the one hand, the granular materials are extremely active and the performer may wish to dramatise their behaviours, on the other hand, the granular materials reach a point of saturation and, at this stage, their individual behaviours are no longer apparent and therefore difficult to dramatise. A performer must therefore decide how to deal with the behavioural materials *in the context of* the broader process. In this example, the process is clearly underpinned by the broad spectral root which, being textural, is unsuited to dramatic, gestural acts of diffusion and would probably suggest an environmental, immersive approach. Such an approach would not only serve the textural materials at the start of the process, it would also serve the saturated noise-based materials that ultimately emerge and, with this in mind, a performer would probably attempt to surround the listener in sound from the opening of the piece through to the conclusion of the *accumulation* process.

In the above example, the performer responds to *both* the musical materials and their structural functions. However, since there are two sets of contrasting materials, the performer is likely to make performance-related decisions relative to those materials most clearly aligned with the function of the

[80] When discussing spectral space, Smalley makes a distinction between canopies and roots, suggesting that "textures can be hung from canopies and use them as goals or departure points, while we already know that the drone can act as a root-reference. Together they frame spectral space, although they do not have to be heard simultaneously to do so" (Smalley 1997, p.121).

process. In the following example, we see the same idea in reverse; *Point of Departure* concludes with further accumulation processes. However, the performer is more likely to foreground the various gestural materials.

The central section of *Point of Departure* is characterised by a drawn-out harmonic texture. A series of overtones emerge from the texture, creating a brief melodic sequence (between 8'40" and 12'00") and a high spectral note emerges and becomes increasingly prominent (between 12'00" and 13'30"). At the same time, some of the granular pulses from the opening of the piece may be heard (although these have been filtered to match the harmonic content of the drawn-out texture). At 13'37" a gestural swell functions as a trigger, introducing some prominent high-frequency noise that is gradually filtered to match the high-frequency spectral note. At this stage, a second accumulation process begins; a series of additional gestural triggers increase the quantity of high-frequency content and one is able to identify the spectral root (as established at the opening of the piece), a spectral canopy (Smalley 1997, p.121), and a sequence of gestural swells that are becoming increasingly active (between 13'37" and 15'18"). Thus, the second accumulation process is characterised by a gradual increase in both spectral energy and activity.

At 15'19", a gestural swell appears to interact with the spectral root, with the former appearing to modulate the pitch of the latter. This apparent interaction may be described using Roy's term *begetting*: "A local link between two proximate units, within a larger progression, where one unit seems to instigate the next by a sudden surge in intensity in a given parameter" (Roy 2000, cited in Stewart 2007, p.93). Similar begetting functions occur at 15'28", 15'51" and 16'06", gradually shifting the pitch (and therefore the function) of the spectral root until it has gradually disappeared. At this stage, the spectral canopy is clearly prominent and the various gestural swells become increasingly active and noisy; this serves to remind the listener of the granular noise heard during the first accumulation process (as described above). A slow glissando, raising the spectral content of the canopy, serves to mirror the gradual process of accumulation, thus heightening the sense of closure to the piece (between 17'40" and 19'15"). The piece ends with a high-frequency sustained note that

gradually fades away; this mirrors and contrasts the opening of the piece, which includes a low-frequency sustained note that gradually appears.

The acousmatic performer is likely to do very little in the central section of the piece; the drawn-out harmonic texture suits an immersive state and the performer may choose to use most of the loudspeakers within the array to surround the listener in sound and thus produce such a state. As the process of accumulation beings, the performer is likely to foreground the gestural swells; these function as triggers and are therefore structurally significant. Despite this, it is necessary to acknowledge the function of these triggers in the context of the broad accumulative process. Thus, the performer is likely to use expressive agential acts that become increasingly dramatic between 15'19" and 16'06". Such an approach would serve the immersive texture at the start of the accumulative process but gradually foreground the gestural behaviours as the process develops. It would also serve to highlight the similarities and differences that hold between the start and end of *Point of Departure.*

This section has considered some of the various ways in which the structural functions of particular musical materials and events may shape the interpretative process. It suggested that performer may develop certain aspects of their interpretative ideals relative to such functions and this may, in some cases, override (or, at the very least, inform) decisions concerning spectromorphological behaviours.

4.1.4 Behaviours, References and Structural Functions (in *Escapade*)

This section considers some of the various ways in which behaviours, references and structural functions coalesce within an entire piece. Accordingly, the discussion, which focuses upon *Escapade* (a stereo acousmatic work composed in 2010), does not focus upon short examples (as above), but provides an holistic account of an entire piece, showing how various points may be considered during the act of interpretation. For the sake of clarity, we shall divide the piece into three large sections; these sections are further subdivided below.

Escapade Section 1 (0'00" – 4'02")

The opening of Escapade is characterised by three substantial phrases. The first phrase begins with a thin spectral canopy that gradually emerges and becomes increasingly thicker until a low-frequency pitch is introduced at 0'47". The dynamic profile of the low-frequency pitch intensifies, leading to a source-bonded orchestral gesture at 1'03". A false-climax (between 1'09" – 1'20") serves to create a sense of expectation before the listener encounters a reiteration of the spectral canopy at 1'33". This introduces the second phrase, which closely mirrors the first; once again, the spectral canopy becomes increasingly thicker, enabling the listener to anticipate the low-frequency pitch that emerges at 2'01" leading to a further source-bonded gesture at 2'04" which serves as an affirmation of the first. On this occasion, the gesture is followed by two further gestures which differ in terms of their spectral and morphological character (2'09" and 2'27"). The third section is characterised by a sequence of orchestral gestures that become increasingly active. The various gestures are heard in relation to those encountered in the previous section. However, their function is substantially changed; the first gesture (2'44") functions as a trigger, introducing a high-frequency noise-based texture. This is followed by further gestural triggers that introduce a cluster of iterative noise-based grains (2'54") and additional high-frequency noise-based textures (3'07" and 3'29"). The various grains and textures are heard in relation to the pitched, orchestral materials and the resulting sound-world approaches spectral saturation (between 3'30" and 3'58"). A low-frequency pitch introduced at 3'52" leads to an orchestral gesture at 3'55". Once again, this serves as an affirmation of the opening gesture of the piece and thus creates an impression of closure.

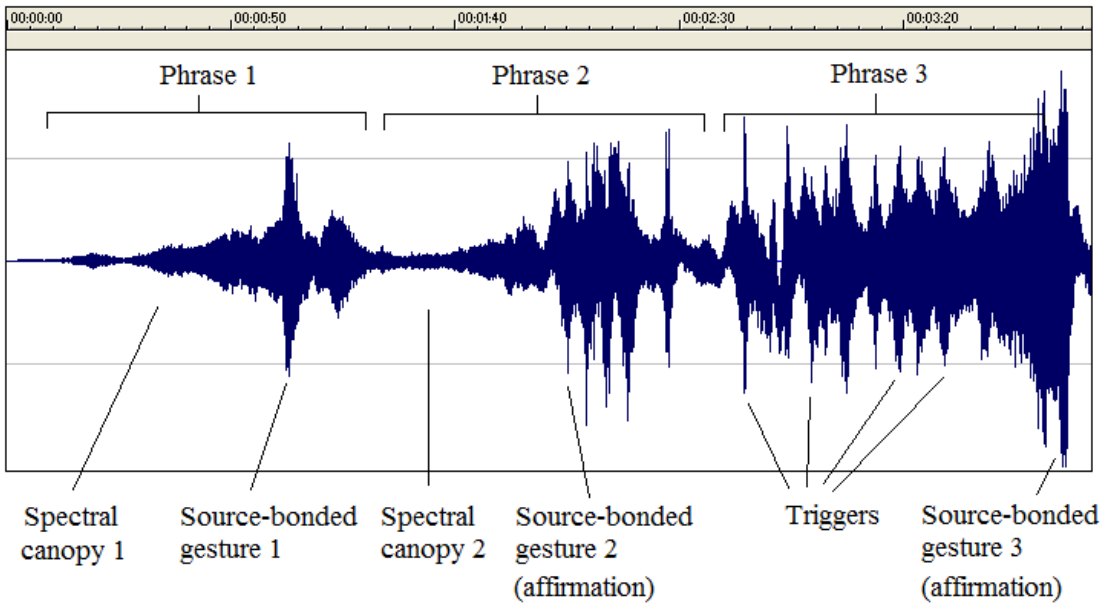


Figure 11: *Escapade* Section 1 (0'00" – 4'02")

The opening spectral canopy may be diffused in a number of different ways. For example, it suits elevation (the spectral canopy appears to occupy an elevated region of spectral space), could appear to emerge from the front or behind, or (given the lack of source-bonding) could even surround the listener in sound. By contrast, the source-bonded orchestral gesture heard at 1'03" suggests a frontal perspectival placement in the listening space; the stereo image would hopefully remain wide to create the impression that a large orchestra is positioned in front of the audience. Acts of sound diffusion could be used to highlight a contrast between these materials. For example, the spectral canopy could be positioned around the listening space before being moved towards a frontal position to root the source-bonded orchestral textures. Alternatively, the opening spectral canopy could emerge gradually from a distant frontal position so that the main and wide pairs of loudspeakers become active as the orchestral gesture appears. Either way, the approach employed during the first phrase will likely dictate the approach employed during the second phrase, in which similar sound materials are used to create a sense of expectation; in order to highlight this similarity, one might expect a corresponding approach in sound diffusion.

The third section introduces a series of noise-based grains and textures. The performer may wish to spatialise these materials, perhaps enveloping the listener in sound. However, the noise-based materials are heard alongside various orchestral gestures, which were previous presented relative to their source-bonded references; this leads to a potential conflict of interest, since the performer may wish to root the source-bonded gestures at the front of the listening space whilst further spatialising the noise-based textures. This apparent conflict may be resolved by considering the structural functions of the orchestral gestures; as the section progresses, the gestures function as triggers that introduce the noise-based materials by degree. Towards the end of the section (as the sound-world approaches spectral saturation), the performer may decide to envelop the listener in sound; the various triggers leading up to this point may be taken as cues that enable the performer to add sets of loudspeakers to by degree, thus culminating in a sense of envelopment befitting the spatial texture without rupturing the source-bonded spaces implied by the orchestral gestures.

Escapade Section 2 (4'02" – 6'52")

Section 2 opens with an extremely active sequence that draws from the orchestral gestures, noise-based grains and noise-based textures heard in Section 1. This sequence may be described as a *simultaneous antagonism* – a term used by Roy to describe two or more sound events or units existing in a conflicting state: "The Antagonistic units will have different timbral identities, and may be in conflict because they exist in extreme registers (one high, the other low), different spaces, or strikingly opposed timbres." (Roy 2000, cited in Stewart 2007, p.95). At 4'31" the simultaneous antagonism is interrupted by an unexpected gesture that temporarily arrests the progress of the noise-based grains and textures. The same gesture functions as a trigger at 4'36", initiating a dense spatial texture in which individual grains are clearly identifiable. The spatial texture can be heard until the end of the section (6'52"). However, it is interrupted at 5'05" and 5'19" (causing a subtle shift in granular density whilst altering the frequency of the underlying noise-based texture) and joined by a low-frequency gesture that rises in both amplitude and pitch to create two false-climaxes at 5'37" and 5'52", and an actual climax at 6'14 (which again causes a

subtle shift in granular density and underlying noise-based texture). A reminder of this climax occurs at 6'48" but does not alter the spatial texture which has, by this stage, all but disappeared.

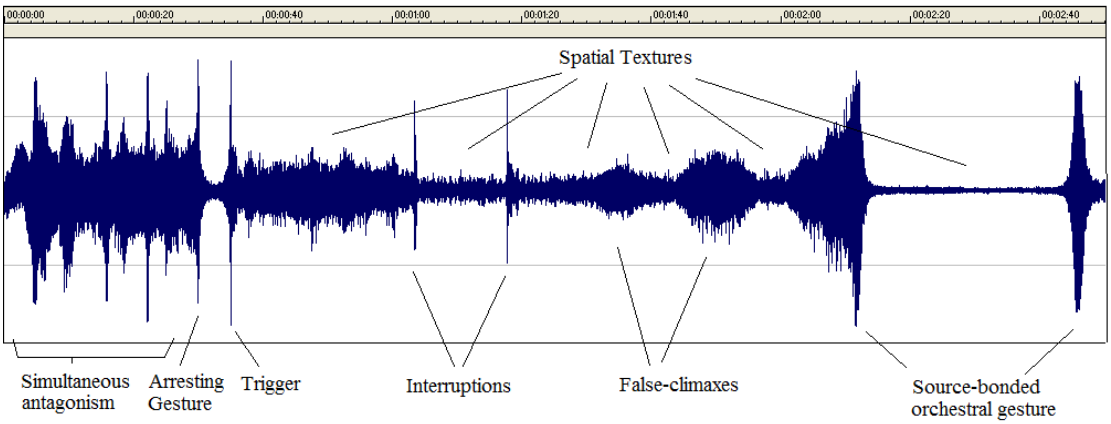


Figure 12: *Escapade* Section 2 (4'02" – 6'52")

The performer is likely to have charted the gradual increase in activity in section 1 by slowly activating the various loudspeakers within the array so that the listener is enveloped in sound. The start of section 2, which is extremely active, enables the performer to explore the whole of the listening space by further dramatising the spectromorphological behaviours of the various gestures across the entire array. It may be possible to use certain loudspeakers for dramatic agential acts whilst leaving others at a static output level; this may give the impression that the noise-based textures are surrounding the listener whilst the gestural activities are behaving within this space and thus serve the simultaneous antagonism described above. The gesture at 4'31" and the subsequent transition between that gesture and the trigger at 4'36" provide an excellent opportunity to contrast the broad exploration of the listening space with a particular movement from one point to another (for example, front to back or vice versa). This movement would be short-lived, since the dense spatial texture (4'36" onwards) suits a further envelopment within the space. From this point onwards, the remaining triggers and (false) climaxes serve to modify the spatial texture; one might expect a corresponding modification of the spatial image across the array. This may be achieved with a sudden tradition between sets of loudspeakers at

the moment at which the trigger occurs, thus giving the impression that the trigger has affected a shift in the spatial distribution of the texture.

Escapade Section 3 (6'52" – 9'44")

The final section brings together the various materials from sections 1 and 2 and therefore serves to remind the listener of key moments heard elsewhere to create a sense of closure. For example, the gestures heard between 7'00" and 7'20" are reminiscent of those heard between 3'19" and 3'32". The orchestral gestures, noise-based grains and noise-based textures heard between 7'20" and 8'02" repeat and extend those heard between 4'05" and 4'33". Finally, the large texture that concludes the piece is a distillation of the numerous pitched sound materials heard between 3'07" and 3'58" (and is particularly similar to materials heard between 3'37" and 3'50"). As Roy points out, conclusions resolve large units in the piece, implying a preparation in the preceding events so that it will be heard as such (Roy 2000, cited in Stewart 2007, p.94). In this case, all of the sound materials have been encountered elsewhere and are explored one final time, implying that a conclusion is imminent.

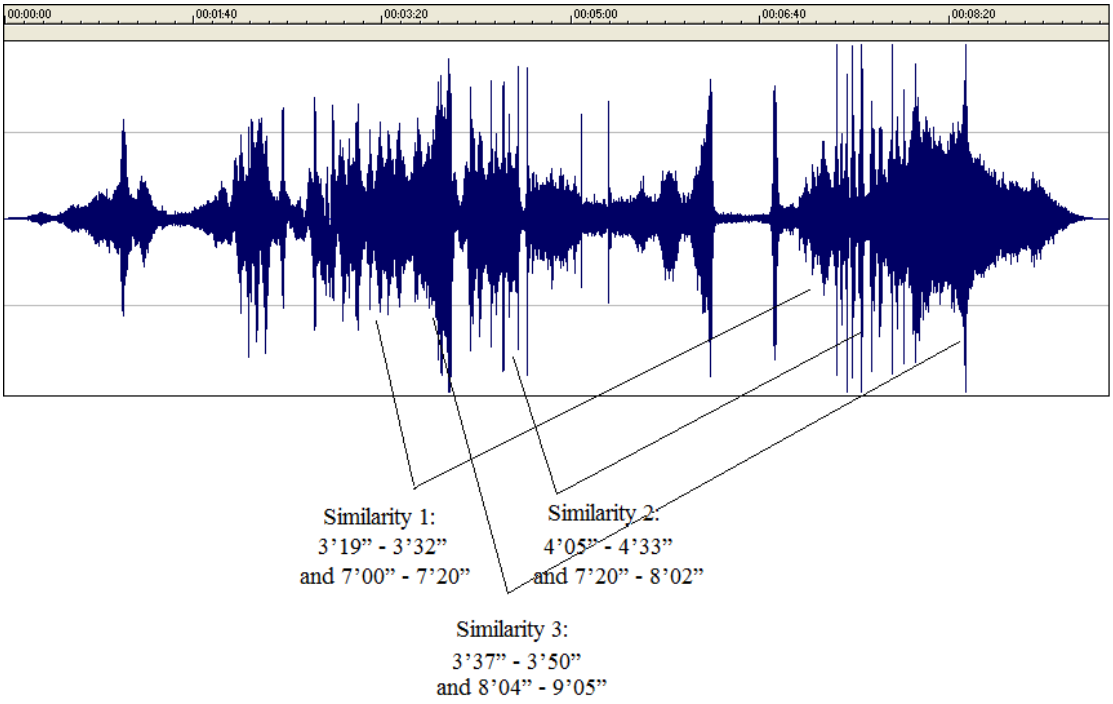


Figure 13: *Escapade* Section 3 (6'52" – 9'44")

The performer may wish to clarify the sense of closure by employing agential acts corresponding to those used earlier on. Thus, if the gestural materials heard between 3'19" and 3'32" were presented towards the front of the audience, gradually moving outwards, the performer may wish to repeat such movements between 7'00" and 7'20" (or, alternatively, use opposing movements, to suggest that the outward expansion is being reined in). The large texture that concludes the piece is reminiscent of the timbral character of materials heard elsewhere and is accompanied by the familiar noise-based grains and textures; given the general tendency to present these materials across the entire array, this final movement would suit one final moment of envelopment before gradually retreating into the distance (back, front, top or sides).

4.1.5 Multichannel Considerations (in *Fractions*)

This section considers how a performer may deal with multichannel works, using *Fractions* (a multichannel (7.0) piece composed in 2011) as a case-study. It is worth remembering (following the discussion in Section 3.3.2) that multichannel works are, on the whole, extremely thick and, as a result, the performer may decide to play back the work by simply setting relative levels on a multichannel ring (perhaps using corrective agential acts in cases where the layout of the room or the room acoustic imbalance the multichannel image). Even so, the performer *may* employ expressive agential acts; this is only possible in cases where the performance space/system is sufficiently large/technically able. Accordingly, the ideas presented in this section are idealised; a range of broader contextual constraints are taken up and discussed in Section 4.2.

Fractions explores Denis Smalley's notion of *space-form* – an approach to musical form which privileges space as the primary carrier of structural coherence (Smalley 2007). To demonstrate this point, we shall consider the first three minutes. The piece opens with various (frontal) perspectival spaces, created by third-order and remote surrogate gestures. At this stage, the various spaces are *distal* – a term used by Smalley to describe the area of perspectival

space farthest from the listener's vantage point (Smalley 2007, p.55). As the various gestural materials become more active, the perspectival space broadens and, although the various materials remain distally located, they begin to surround the listener, moving increasingly away from the frontal position towards an exploration of circumspace. Between 1'30" and 2'09", the various distal spaces begin to encroach upon *proximate space* – the area of perspectival space closest to the listener's vantage point (Smalley 2007, p.55). This encroachment becomes much more apparent between 2'09" and 2'58"; a large gesture-carried texture presents manifold (sequential and simultaneous) spatial images which envelop the listener, appearing to occupy both distal and proximate space. Accordingly, the first three minutes of the piece are defined by the gradual progression from distal perspectival space to proximate perspectival space and from a situated (frontal) space into circumspace.

Assuming that the diffusion system is sizeable, the acousmatic performer may employ additional multichannel rings (or parts thereof) to further augment or enhance the spatial form outlined above. For example, imagine a diffusion system with two multichannel rings, as shown in the diagram below:

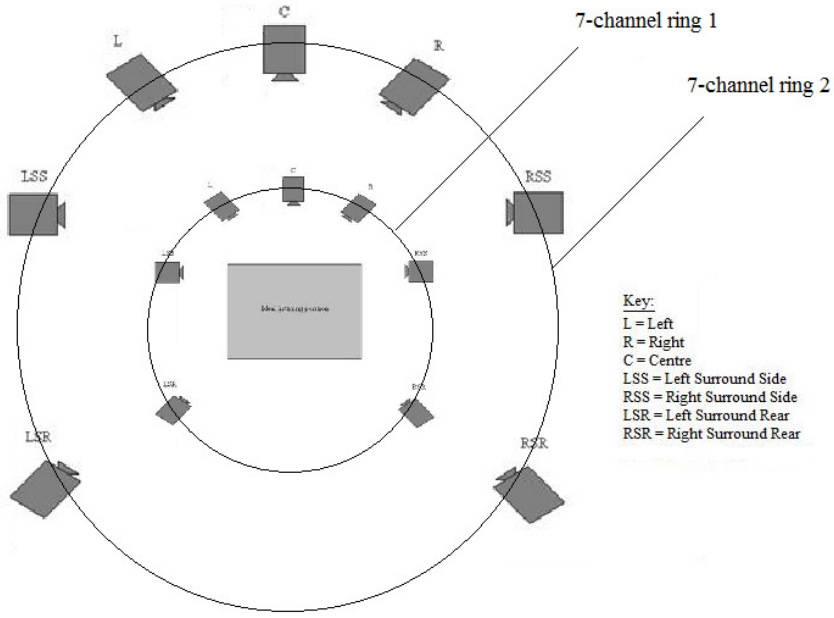


Figure 14: Multichannel rings for *Fractions*

At the opening of *Fractions*, the performer could employ the larger multichannel ring, thus situating the sound materials further away from the listener to enhance the impression of distal space. This approach may also serve the gradual move towards circumspace, at which point the performer could gradually transition from 7-channel ring 2 to 7-channel ring 1, thus mirroring the encroachment upon proximate space towards the end of the first three minutes. Accordingly, the two rings could be used to enhance the spatial form of the piece. An alternative approach may combine loudspeakers from the two multichannel rings. For example, at the start of the piece, L, C and R from 7-channel ring 2 could be used alongside LSS, RSS, LSR and RSR in 7-channel ring 1; this may foreground the distal perspectival materials that are situated in front of the listener but ensure that any materials around the sides/rear of the multichannel ring remain relatively proximate. As the piece develops, the performer could employ the two rings simultaneously to highlight the manifold (sequential and simultaneous) spatial images.

The approach outlined above may be scaled up in accordance with any large diffusion system; entire multichannel rings (or part *of* those rings) may be employed during the act of diffusion. This approach is particularly suited to the presentation of multichannel works that foreground spatial behaviours and forms, since these may be further enhanced/spatialised across the entire loudspeaker array and therefore listening space. Multichannel diffusion is only possible in cases where the diffusion system allows for movements between rings of speakers or, in some cases, where a single multichannel ring is augmented with a few additional loudspeakers.

4.2 Contextual Constraints

The previous section highlighted the *need* for acts of interpretation, and suggested that performers develop their interpretative ideals relative to the sonic behaviours, references and structural functions found in specific acousmatic works. These ideals may be more, or less, crystallised in the mind of the performer. However, the performer cannot possibly make *all* of their various interpretational decisions in advance of a performance; various contextual

constraints will determine what is possible and, in many cases, what is suitable in a given performance situation. To demonstrate this point, we shall consider three main contextual constraints, including the type of diffusion system, the acoustic of the performance space and the size and placement of the listening public[81].

Acousmatic performers may develop interpretative ideals in advance of a given performance. However, these ideals often need to be adjusted in response to the specific diffusion system that is being used[82]. For example, a performer may decide that a high spectral texture is best presented above the audience in order to situate the sound relative to its perceived occupancy of spectral space. This decision may function particularly well as an interpretative ideal. However, unless the diffusion system has a set of loudspeakers located above the audience, it will be impossible to achieve during the act of performance. This point is particularly pronounced when one considers the presentation of multichannel works; the performer may intend to perform a given work but discover, upon seeing the diffusion system, that playback is the only option. These examples, which imply that diffusion systems necessarily constrain interpretative ideals, may be inverted; diffusion systems may also present certain possibilities that were not considered during the formulation of an interpretative ideal. For example, the BEAST system has certain pre-set movements that, unless known in advance, will not figure in an interpretative ideal until they discovered during the rehearsal. In this example, the interpretative ideal will still require some adjustment, albeit to encompass previously unconsidered possibilities.

Interpretative ideals are not merely adjusted relative to diffusion systems but are, in most cases, adjusted in response to the particular space in which the performance will take place; as discussed in Section 1.3 and Section 2.2, the acoustic influence of listening spaces may have significant impact upon the various sounds that occur during a performance and thus alter certain features or

[81] This section is relatively short, since many of the central ideas have discussed above. For example, diffusion systems were discussed in Section 2.1 and Appendix II, performance spaces were discussed in Section 1.3, and listeners were discussed in Section 2.3 and Appendix I.

[82] The specific diffusion system in use *may* be known in advance and, in such cases, the performer is able to develop an interpretative ideal relative to that system. This is not always the case and, as a result, performers are often required to make significant interpretative decisions during a rehearsal (and sometimes during a performance).

properties of the associated work. In some cases, the performer will be familiar with the space, and may draw upon their prior experience during the formative process outlined above (Section 4.1). In some cases, the performer will be unfamiliar with the listening space and will, as a result, need to use any rehearsal time to assess how the space affects the work. We shall briefly consider this point.

The acousmatic performer may have formulated an interpretation in advance of a performance. However, the acoustic influence of the listening space may require an adjustment to this interpretative ideal. For example, the performer may find a work's dynamic range and spatial image(s) to be (unexpectedly) expanded or compressed, or that reflections, refractions and absorption alter the work's various spectral and spatial properties (as discussed in Section 2.2). The performer may respond in one of two ways; the performer might find the acoustic influence of the listener space problematic and, as a result, employ a range of corrective agential acts or, alternatively, he or she may embrace (and even attempt to enhance) this influence using expressive agential acts. Either way, it is likely that performers will either adjust or reconsider their interpretative plans in response to the listening space. This point has been mentioned by Simon Emmerson, who notes that: "[...] different interpretations are seen as venue specific" (Emmerson 2007a, p.31).

The performer may become accustomed to the performance space during a rehearsal. However, it is necessary to listen from a variety of positions within the space to account for the various positions that audience members may occupy. This point has been raised by Trevor Wishart:

> During rehearsals it's important to listen from various different seating positions in the auditorium, paying particular attention to the most peripheral seats (those furthest removed from the ideal centre of the stereo image). A projection [or diffusion] may sound perfect from a mixing desk placed at the centre of the stereo image but underwhelming if sitting on the periphery so compromises may have to be made to provide a good experience for the majority of the audience.
>
> (Wishart 2012, p.160)

This point applies to the interpretative ideal; planned agential acts may need to be adjusted to account for the various positions that listeners occupy. Interpretations are listener-directed and must therefore serve the needs of the listener within the concert space.

Interpretative decisions that are formulated during a rehearsal *may* need further adjustment during the act of the performance. This is because: "The presence of the audience will itself alter the venue acoustic [...]" (Wishart 2012, p.160). Wishart goes on to suggest that this should not drastically alter the main features of the rehearsed diffusion, suggesting that any changes are mostly likely the affect the overall sound level and dynamic contours found within the work.

This brief section serves to highlight the following point: interpretative ideals, which are typically formulated in advance of a given performance, often need to be adjusted (sometimes significantly) immediately prior to, and even during, a given performance. Thus, advance preparation, although crucial if the performance is to succeed, is not a panacea. With this in mind, the following is clear: interpretations require a range of specific skills that may be called upon and relied upon during the act of performance. The following section considers this point and highlights some of the various ways in which interpretative skills are developed, regulated and refined.

4.3 Developing Interpretative Skills

In *Analysis and (or?) performance,* John Rink suggests that interpretations are primarily formulated while one is practising and rehearsing[83] (Rink 2006, p.39). This claim is made in reference to scored, instrumental music. However, it holds for music of the acousmatic tradition; both diffusion skills and interpretative skills develop with practice. In other words, as performers become more acquainted with a wider range of acousmatic works, performance spaces and sound diffusion systems, their ability to identify and overcome specific challenges will (hopefully) improve. Thus, interpretative skills mature over

[83] Rink also suggests that "[...] new discoveries are sometimes made during performance" (Rink 2006, p.39).

time, becoming more sophisticated and refined with practice and the performer's interpretative vocabulary is often enriched through the process of trial and error.

In the acousmatic tradition, rehearsal opportunities are often severely limited; diffusion systems are often set up for specific performances and are rarely available for long periods of time prior to a performance. This often constrains the performer's ability to practice and thus formulate and realise interpretative ideals. In some cases, the lack of rehearsal time forces performers to play back works or use relatively limited corrective agential acts. In other cases, the performer may resort to tried-and-tested diffusion techniques or formulate an interpretation *on-the-fly*, responding to the space, the diffusion system and the work in real-time. Performers that are extremely familiar with the practice of sound diffusion may find limited rehearsal opportunities far less problematic. Thus, practice may serve to overcome the limitations of individual rehearsal opportunities[84].

Interpretative skills are not merely developed through practice. They are also developed in relation to the skills of others. This point is raised by Stephan Reid, who, in *Preparing for Performance*, suggests that interpretative skills are informed, shaped, refined and reinforced by listening to other performances:

> Both the pedagogical and the psychological literature suggests that listening to the performance of others is the most effective means of developing interpretative skill.
>
> (Reid 2006, p.107)

Reid goes on to suggest that performers should not seek to imitate the interpretative acts of others. However, he notes that the various expressive acts characteristic of a good performance are often absorbed by performer and thus serve to enrich their interpretative vocabulary. Accordingly, *listenings*, a term used by Reid, may help performers to identify prevailing stylistic tendencies that are located within a given tradition and thus inform their subsequent practice (Reid 2006, p.107). Reid does not develop this idea any further. However, it seems reasonable to suggest that listenings perform a normative function that

[84] The opposite might also be true; performers that are extremely experienced diffusers may require *more* time in rehearsal to ensure that their idealised interpretative intentions are realised and not left to chance.

regulates practice; through the process of listening to others, performers (potentially) develop an interpretative vocabulary that informs the process of formulating interpretations. We shall briefly consider this point.

Reid is primarily concerned with scored, instrumental music of the Western classical tradition (Reid 2006). However, his various comments may be applied elsewhere. For example, in the acousmatic tradition, interpretative skills are also informed and influenced by the process of listening to others; these listenings may help the performer to develop skills relevant to the act of sound diffusion but they also help performers to formulate and execute their own interpretations of works[85]. Accordingly, the following point may be raised; interpretations are not merely formulated in response to specific works and performance situations but are, in many cases, formulated in response to other listenings. Such listenings perform a normative function and thus regulate practice.

Listenings regulate interpretational practice. However, a performer's *ability* to listen to others may be limited by certain (often unavoidable) constraints; these may include geographic, social, economic, cultural, temporal constraints, and so on. With this in mind, one is likely to discover localised variations in interpretative approaches and styles; a performer's practice is regulated by their listenings but this is, in turn, consistent with what the performer is *able* to listen to. There are, of course, other factors involved. For example, localised variations will be determined by the diffusion systems that are available; as discussed in Section 2.1 and Appendix II, various differences hold between homogenised diffusion systems (as are often found in the United Kingdom) and non-homogenised diffusion systems or loudspeaker orchestras (as are often found in France) and these differences determine (at least in part) the ways in which interpretations are formulated. Accordingly, these differences serve to reinforce localised variations and thus feed into a regulative loop that ultimately characterise performing traditions and communities.

[85] It is (often) difficult for a listener to identify what a performer is doing during the act of sound diffusion; diffusers are often hidden from view, their various actions and gestures are not necessarily seen and it is extremely difficult to differentiate between the work and the interpretation *of* the work. Despite this, the act of listening may suffice to *enrich a performer's interpretative vocabulary* and, as a result, the specific actions and gestures employed may be worked out at a later date.

With the above in mind, one may suggest that interpretations draw from, reflect and reinforce the (potentially diverse) approaches and stylistic tendencies of performing traditions and communities. Thus, the act of listening to others is, in many ways, central to the acousmatic musical performance; through such listenings acousmatic performers do not merely develop interpretational skills and ideas, but inform the development and determination of the normative functions and regulative margins in which their practice will ultimately reside.

4.4 Summary

This chapter considered some of the various ways in which performers formulate interpretations. It started by discussing the interpretation of acousmatic works, suggesting that the performer is informed by, and responds to sonic behaviours, references and their associated structural functions. To demonstrate this point, examples, drawn from the associated portfolio of original works, were introduced and explained, and an interpretative ideal presented and defended. Following this, the chapter considered performance situations, and discussed performance spaces, diffusion systems and intended audiences. The following point was raised: interpretations must respond to both works *and* performance contexts, since both play a significant role in shaping what emerges in performance. The chapter concluded with a brief discussion of interpretative skills, and suggested that these develop with practice, over time and in relation to the interpretative skills of others. Taken as a whole, the three sections within this chapter provided an idealised ontological account of the interpretative act, the decision-making processes that underpin such an act and the various factors that help interpretative skills to become focuses and refined.

Chapter 5: Authenticities

This short chapter considers the notion of performance *authenticity.* It starts by suggesting that authenticity, which is an ontological requirement (as opposed to an interpretative option), is typically *valued* by composers, performers and listeners (Section 5.1). The following two sections consider whether performance authenticity relates to: 1) the composer's performance-related intentions (Section 5.2), or 2) the composer's work (Section 5.3). The ensuing discussion, which draws upon Wollheim's notion of types and tokens (Wollheim 1980) and Davies' discussion of thick and thin works (Davies 2004), concludes with the following claim: in the acousmatic tradition, works are extremely thick, interpretative options are relatively limited and, as a result, most performances are, at the very least, *minimally* authentic, even if they fail to be *ideally* authentic.

5.1 Valuing Authenticity

In a recent talk, Jonty Harrison described the experience of listening to one of his own musical works being performed by someone else:

> I was once unfortunate enough to be subjected to a 'performance' of my early work *Pair/Impair*, in which a 'modified repeat' section is encoded at a significantly lower amplitude than on its first appearance – a kind of 'structural echo'. This section was diffused at the same (ear-splitting) level as its initial appearance, the performer misreading the cues on the support medium and mistakenly compensating for the supposed 'drop' in level; the structure of the piece was pretty much obliterated.
>
> (Harrison 2011, p.6)

This short recollection served to contextualise an earlier observation; performance interpretation "opens up the possibility of formal 'distortion' and misrepresentation" (Harrison 2011, p.6). One *may* suggest that distortions and misrepresentations are an inevitable consequence of the interpretative act.

However, this suggestion brings up the following question: are all acousmatic performances equally and ideally *authentic*?

Before answering this question, it is worth making two preliminary observations. Firstly, authenticity is (presumably) something that listeners, composers and performers *value*. This point has been raised by Roger Scruton:

> There would be little point in the distinction [between authentic and inauthentic performances], if we could not think of authenticity as a value – as something at which we might aim, not just for curiosity's sake, as we might aim to reconstruct the taste of a Roman supper, but as part of our appreciation of the music.
>
> (Scruton 1999, p.443)

Secondly, the notion of performance *authenticity* and the notion of performance *interpretation* are clearly distinct; the ostensible value of performance authenticity needs to be rationalised in relation to an ontological imperative that presumably underpins the acts of performers. This point has been raised by Stephen Davies:

> Because it is essentially implicated in a work's performance, authenticity is an *ontological requirement*, not an *interpretative option*. By this I mean that the pursuit of authenticity – enough, at least, to make the performance recognisably of its topic work – is not merely one interpretative possibility among many, equally legitimate, alternatives. [...] If one is committed to playing the given piece then, equally, one must be committed to performing it authentically.
>
> (Davies 2004, pp.207-208)

With the above in mind, one may suggest that performance authenticity is an ontological requirement that is valued within performing traditions. This observation does not answer the question raised above, but it hopefully explains why this question is relevant to the current investigation. We must now consider what the term *authenticity* means, survey some of the various ways in which this term has been employed by ontologists before developing an account of acousmatic performance authenticity.

5.2 The Composer's Intentions

Some ontologists rationalise and explain the notion of performance authenticity in relation to intentions of composers, or, more accurately, the *performance-related* intentions of composers. In this context, a performance is deemed to be authentic if (and only if) it *validates* the original intentions of the composer, thus presenting the work as it was supposed to be heard. We shall briefly discuss this view and consider whether it may be used in the current context.

The idea that performance authenticity can be understood in relation to the composer's intentions invites the following (inevitable) criticism; the intentions of a composer are, as Taruskin has pointed out, private mental events and this typically means that they cannot be accessed. Taruskin's goes on to suggest that this problem becomes particularly significant when one is historically and culturally removed from the context in which the composer worked (Taruskin 1988). In such cases, it is often impossible to know what the composer intended and, with this in mind, Taruskin suggests that performance authenticity must be understood by looking elsewhere.

Some ontologists disagree with Taruskin's point. For example, Stephen Davies claims that the composer's intentions are clearly expressed in the scores that they issue: "Provided we are acquainted with the conventions on which their successful expression depends, we can often know quite clearly what was intended by the work's composer" (Davies 2004, p.211). Davies' point, which only applies scored works, has been echoed by Simon Emmerson, who is concerned with the presentation of acousmatic music:

> The musical *intentions* of the composer are encoded in the work as 'stored' (in whatever format). Hence the function of sound projection [or sound diffusion] is to present these to the greatest effect.
>
> (Emmerson 2007a, p.148)

Despite this, Emmerson goes on to note that these intentions may be very difficult to realise. A composer may have intended a work to be presented on a particular diffusion system or in a specific performance venue, yet the performer

may not have access to such a system or venue and is, as a result, unable to meet the composer's intentions:

> [...] there are changes in both studio and concert presentation *spaces*, some the result of social change. The composer's soundfield in a studio or a performance space of 1960 may not now be achievable. Although we may claim to have 'made it better' in contemporary monitoring environments, this still breaks the 'authentic' ideal. And further we may have endless debates as to the composer's intentions for performance, especially if they are not present or were not written down. Did they have a particular loudspeaker array in mind when producing the final work? Or, like the composer at an orchestral rehearsal, should their opinion be treated as just one input of several? Musical interpretation will evolve and perhaps the composer's view should in time be ignored.
>
> (Emmerson 2007a, p.148)

The final sentence in the above statement appears to be very closely aligned with Peter Kivy's notion of *counterfactualism* (Kivy 1995). In *Authenticities: philosophical reflections on musical performance*, Kivy suggests that performers should not search for a composer's performance-related intentions but should, instead, ask the following counterfactual question: what would the composer want *in this particular context*? (Kivy 1995, p.86). This counterfactual question treats the composer's opinion as one input of several and thus enables performers to formulate interpretations in relation to the immediate performance situation in which they find themselves. This approach is advocated elsewhere. For example, although he is primarily concerned with performing music of the past, the following observation from Roger Scruton seems very closely related to Kivy's notion of counterfactualism:

> Musical performance [...] involves an ongoing dialogue between composer and performer, a dialogue across generations, in which the dead play as great a part as the living. Such is the nature of every healthy culture, and just as the composer lays down instructions for the performer, so does the performer, in his turn, instruct the composer, setting the piece in a new social and musical context, and dressing it accordingly. So vivid is our sense of this dialogue between generations, that we do not, in practice, confine ourselves to a study of the composer's actual intentions. We are just as interested in his hypothetical

> intentions: what *would* he have wanted, we ask ourselves, if he were living now, in this society, and with an audience like this?
> (Scruton 1999, p.445)

Counterfactualism does seem to be more sensible than the (potentially futile) search for the composer's performance-related intentions. However, it does not necessarily resolve the issue that is currently under consideration; performers may prefer to ask counterfactual questions and prepare their performances accordingly, but this still leaves the issue of authenticity unresolved. In other words, answers to counterfactual questions are just as prone to distortion and misrepresentation as the interpretations that invariably follow. With this in mind, we shall look elsewhere.

5.3 The Composer's Work

For Stephen Davies, performance authenticity can only be understood by considering the various relations that hold between musical works and their performances (Davies 2004). In other words, he is not primarily concerned with the composer's performance-related intentions, or even their counterfactual intentions. Instead, he is concerned with ontological nature of musical works and performances and, with this in mind, he suggests that authenticity should be understood in relation to his type-theory and his notion of thick/thin works (as discussed in Section 3.2 and Section 3.3); for Davies: "issues of authenticity and of ontology cannot be separated." (Davies 2004, p.207). We shall briefly consider his thesis before considering whether it is suited to the current investigation.

As discussed in Section 3.3, Stephen Davies' believes that musical works are types of sound structures. In some cases, these types are ontologically thin, and thus most qualities of the performance are aspects of the performer's interpretation, in other cases, these types are ontologically thick, and thus the composer controls the sonic detail of the work's accurate instances. Despite this works *for* performance are always thinner than their various instances and, with this in mind, Davies suggests that an ontological gap holds between works and their performances; performance interpretation takes place *within* this gap:

> Works for performance are always ontologically thinner than their performances, [thus] interpretation involves the performer's choices about how this ontological gap is filled. At this level, the performer is free within broad limits set by the style and genre of the piece.
>
> (Davies 2004, p.111)

Davies goes on to discuss the notion of performance authenticity using the same idea. He implies that just about anything can be done *within* the ontological gap and, so long as the work's various properties are presented, the performance will be *ideally authentic*. With this in mind, Davies suggests that two performances of the same work may be equally authentic even if they differ: "Each shares with the others those elements produced in the faithful realisation of the [work], but each differs from the others according to the performer's free choices" (Davies 2004, p.209).

Davies goes on to suggest that the performer's free choices do not relate to the notion of performance authenticity; so long as the performer presents the work's various properties, the performance will always be at least minimally authentic. As a result, a composer or listener may not find the performer's choices particularly rewarding, but this does not necessarily mean that the performance is *inauthentic*, it may simply mean that the performance is not particularly good. With this in mind, Davies suggests that the ostensible binary distinction between apparently authentic and inauthentic performance is far too simplistic:

> Authenticity in performance comes in degrees. [...] a performance can be of a musical work, though it represents it imperfectly (owing to performance errors, for instance). Any performance that succeeds in instancing the piece is (at least minimally) faithful. A performance might fail to be ideally authentic, while being sufficiently authentic to qualify unequivocally as an instance of the given work.
>
> (Davies 2004, p.207)

Davies' position on authenticity avoids the various problems associated with the search for a composer's intentions (or counterfactual intentions). However, it is predicated upon one's ability to identify a work's properties (as

discussed in Section 3.3). In this respect, Davies' view on authenticity *may* be appropriate. However, it is very difficult to identify an acousmatic work's properties (as discussed in Section 4.1) and, with this in mind, it is difficult to apply Davies' idea to works of acousmatic music. Despite this, one may employ Davies' broad approach and arrive at a very similar conclusion, as discussed below.

In Section 4.1, we struggled to differentiate between the properties of acousmatic works and their performances; the following reason was presented and defended: acousmatic works are types, their performances are tokens and, since types are only ever encountered *in* or *through* their tokens, the concrete details of the latter may conceal the schematic, indeterminate nature of the former. Despite this, we also suggested that acousmatic works (types) are extremely thick and, as a result, the composer controls many of the various properties heard in performance. This implies that a significant proportion of a work's properties will always be shared by its various performances and, as a result, it seems reasonable to suggest acousmatic performances are always *minimally* authentic, if not *ideally* authentic; a work's properties may be distorted or altered by the listening space and the act of diffusion certainly "opens up the possibility of formal 'distortion' and misrepresentation" (Harrison 2011, p.6). However, acousmatic works are extremely thick, interpretative options are relatively limited, and, as a result, the following claim may be justified: an acousmatic work's properties will be present in just about all of its various performances and this implies that those performances will, at the very least, minimally authentic.

At this stage, we may return to Harrison's discussion of *Pair/Impair* (Harrison 2011). Although Harrison was displeased, he recognised the performance as a performance *of* his work and, as a result, it seems reasonable to suggest that it was, at the very least, minimally authentic. In other words, the performer may have distorted or misrepresented certain aspects of the work but this does not necessarily mean that that one needs to describe the performance using the term *inauthentic*; perhaps it might be better to suggest that the performance was simply not very good.

5.4 Summary

This chapter considered whether acousmatic performances may be authentic and/or inauthentic. It started by discussing authenticity as an ontological value before surveying some of the various authenticity theories. The composer's intentions and counterfactual intentions were considered as an authenticity benchmark. However, since the composer's intentions are not necessarily known, this approach was rejected. Instead, Davies' ontological account of authenticity was introduced and employed. The following conclusion was reached: acousmatic works are extremely thick, interpretative options are relatively limited and, since authenticity comes in degrees, this typically means that most, if not all, acousmatic performances are, at the very least, minimally authentic.

Conclusions

The aim of this investigation was provide an ontological description of the acousmatic musical performance, explicating the many interwoven factors that coalesce within the performance environment whilst surveying the complex network of relations that hold between them. This was achieved by abstracting and dissecting individual performance constituents to unravel and explain the collective input of composers, performers, listeners and technologies, resulting in the presentation of an idealised model of the acousmatic musical performance, based upon *sounds, agents, works, interpretations* and *authenticities.* Taken as a whole, the constituents of this model served to highlight the numerous, multifaceted and often heterogeneous elements that are conjoined within the acousmatic performance environment.

Much of the discussion centred upon the various relations that hold between acousmatic performances and acousmatic works. This served to highlight certain ontological misgivings that appear to arise from the mistaken belief that acousmatic works are fixed, concrete formations that are largely identical in successive instantiations. Such misgivings, introduced in Chapter 1 and restated in Chapter 3, were dismissed and an alternative work-concept was presented and defended; acousmatic works were described as schematic, indeterminate types of sound sculptures that underdetermine the concrete details of their various instances. This observation aligned music of the acousmatic tradition with the type-token hypothesis (and therefore the dominant ontological paradigm), and illuminated the complex nature of the work/performance relationship.

The type-theory provided a theoretical platform upon which a discussion of performance *interpretation* was subsequently built, and the following point was raised: acousmatic works, being indeterminate types, present the performer with myriad interpretative options, each requiring a specific decision on the part of the performer. Numerous factors influence this decision-making process and, as a result, successive performances of the same work invariably differ, depending upon how the performer chooses to concretise indeterminacies

present in the associated work. This invariably raises the question of performance *authenticity.* However, the acousmatic work is extremely thick, interpretational options rarely limited and, as a result, performances are usually at least minimally authentic, if not ideally authentic.

The investigation uncovered a range of factors that constrain, regulate and determine the nature and/or character of the acousmatic musical performance. It suggested that performances are agent-centred, skilful activities, but that agential skills are shaped by the self-regulatory influence of performance traditions and communities. The skill of performance interpretation is perhaps one of most highly regulated, since performers are invariably influenced by, and ultimately draw from, a stock of previous listenings that are both culturally and contextually grounded. An understanding of these influences enables the performer to understand how his or her actions may be informed by (and subsequently inform) the agential acts and interpretations of others.

The various ideas presented throughout this thesis were informed by (and informed) the creation of six original acousmatic works (included in the associated portfolio of compositions). As discussed in Chapter 4 and Appendix III, the process of composing and performing two acousmatic works (*Isthmus* and *Early Morning*) highlighted the need to differentiate between corrective and expressive agential acts. This led to the realisation that acousmatic works are, in some respects, incomplete, being characterised by indeterminacies that are concretised during performance. To understand this realisation, a type-theory, based upon Stephen Davies notion of thick and thin works (Davies 2004), was developed. This theory was tested and refined through the creation and performance of *Parenthesis* (a thin work), *Point of Departure* (a thick work), *Escapade* (a work that is both thick and thin) and *Fractions* (a multichannel work). Taken as a whole, these works revealed numerous advantages and disadvantages relative to the notion of performance interpretation and suggested ways in which the composer may encourage agential and interpretative acts of sound diffusion. Accordingly, the relationship between the practical composition and the theoretical ontological research was not only instructional and cyclical, but central to the development of the research.

The findings of this research are useful to musical ontologists who have, on the whole, marginalised (and misunderstood) music of the acousmatic tradition[86]. At the very least, it serves to undermine the *fixity* view (that is all too often associated with the term *playback*), but it is also likely to contribute to the on-going development of the type-theory, broadening the investigative scope by highlighting the type-theory relative to a particular (and previous absent) discipline. There is a broader issue at stake: ontologists have not merely overlooked music of the acousmatic tradition, but most forms of music that involve the use of technology. The ideas presented in this thesis may provide an ideal starting-point for a broader ontological enterprise that serves *all* music on a fixed medium.

The findings of this research are equally valuable to the composer, since an awareness of the numerous elements that coalesce in the acousmatic performance may shape, inform and direct the compositional act. As demonstrate above, composers may situate performance at the centre of the creative process and, in doing so, produce works that have a performance-*telos*. Thus, composition and performance go hand-in-hand, each serving and maintaining the other. Finally, the findings of this research are equally relevant to the acousmatic performer, who may now consider the use of agential and interpretative acts relative to specific sounds and works. As stated at the start of the thesis, the act of performance is situated at the heart of the acousmatic tradition and, as Denis Smalley pointed out: "this final act becomes the most crucial of all" (Smalley 1986, p.92).

[86] This was demonstrated by a recent invitation (to the author) to address the *Aesthetics Research Centre* at the Department of Philosophy, The University of Leeds. The talk (title: *Abstract and Abstracted, Concrete and Concrète: the ontology of musique concrète and the future of the acousmatique*) focussed upon certain misgivings relative to the use of the terms concrete and concrète and presented the type-theory outlined in Chapter 3 of this thesis.

Appendix I: The Acousmatic Listener

The acousmatic listener receives very little attention within this ontological investigation. This is because the listener's role is not ontologically central; acousmatic performances may be listener-directed (as discussed in Section 2.3). However, the listener does not form a fundamental constituent of the performance and cannot be described as one of the central ontological ties that the performance enters into (from an ontological perspective, listeners are certainly not on a par with acousmatic sounds, agents or works). Further to this, the various topics that (potentially) relate to the acousmatic listener may include: imagination, cognition, reception, affectation, intentionality, proprioceptivity, and so on. These topics are invariably interesting and would certainly merit further discussion. However, such a discussion would become a phenomenological (as opposed to ontological[87]) investigation and would therefore fall beyond the self-imposed boundaries of this thesis. Instead, this investigation concurs with the following point made by Simon Emmerson:

> Listeners are not an essential component of the performance; while required to complete the work their influence is small. Their listening is intended by the composer and performer to be total and exclusive.
>
> (Emmerson 2007a, p.31)

Emmerson's point is invariably correct. However, his use of the term *complete* is inherently problematic, since it implies that composers do not complete their own musical works and that performances are subsequently joint ventures in which listeners play a crucial role. This is surely not Emmerson's intended meaning, since he suggests that the listener's influence is small and non-essential and, further to this, most ontologists have dismissed the idea that listeners *complete* works. For example, Stan Godlovitch says:

> The joint venture view needs taming. [Musical events] must meet many conditions, independent of the listener, to count as performances. The listener's experience itself depends upon

[87] The distinction between phenomenology and ontology is discussed below.

> their realization. Such conditions as the existence of musical works, skilled players, playing traditions, and so on, are scarcely peripheral. This should disable any enticement to exotic romances which cast the listener as the chief agent in the creation of music events. Composers do the composing; musicians do the interpreting and presenting. Whatever the status of listeners, to place them on a par with music-makers is just crazy.
>
> (Godlovitch 1998, p.45)

With this in mind, it is worth briefly considering what Emmerson means by his use of the term *complete*. Accordingly, the following section, taken from *Materialising Time and Space within Acousmatic Music* (Kilpatrick and Stansbie 2011, pp. 55-58) is offered by way of an explanation. The full paper considers some of the various ways in which spatial and temporal aspects of acousmatic works are constructed and understood by listeners but this short introductory section presents and defends the following point: acousmatic works contains indeterminacies that are radically dependent upon acts of listening intentionality. Thus, listeners do not complete works, but their acts of listening are aesthetically central[88].

I.i: Intentionality and the Intentional Construction of Time and Space

"In this section, it will be claimed that spatio-temporal relationships in acousmatic musical works are (largely) dependent upon intentional acts of consciousness; such acts are varied and, as a direct result, acousmatic works frequently contain complex layers of spatio-temporal information. We start by introducing the phenomenological notion of intentionality before applying this term to the acousmatic work.

This phenomenological term *intentionality* refers to the content of a psychological act and the various ways in which such acts are directed towards objects or entities (Moran 2000). We may generalise that some objects or

[88] The remainder of this Appendix is abstracted, verbatim, from *Materialising Time and Space within Acousmatic Music* (Kilpatrick and Stansbie 2011, pp. 55-58). The section is primarily concerned with time and space. However, the section presented below discusses listening intentionality and is therefore relevant to the current topic.

entities depend upon intentional acts for their continued existence, whereas others do not. For example, a sculpture is distinct from a mere lump of stone because it has certain meaning-oriented, aesthetic qualities. These qualities are dependent upon a viewer intending towards the sculpture in an appropriate way. Thus sculptures, unlike mere lumps of stone, can be described as *intentional objects.*

Pieces of acousmatic music are no different; they also have meaning-oriented, aesthetic qualities which separate them from mere acoustic signals. In other words, acousmatic works require the listener to intend towards them in various ways. This observation is not new; much of Pierre Schaeffer's work is a development of Husserlian notions of intentionality. For example, Schaeffer's concept of the *sound object* was articulated in precisely these terms. He described the sound object as: "the meeting point of an acoustic action and a listening intention" (Schaeffer 1966). However, when defining sound objects, Schaeffer had a specific sort of intentional act in mind, which he called this *reduced listening*. Reduced listening is an intentional act in which one deliberately brackets-out, or otherwise isolates, any real or supposed sources of a sound. In doing so, reduced listening acts like a mirror; it directs attention away from the spatio-temporal causes of a sound and instead reflects them back upon the content of the listener's experience. Thus, sound objects are intentional since they are radically dependent upon specific and directed mental acts of consciousness. This contrasts with what Schaeffer calls *direct*, or *natural*, listening where one identifies the source or cause of a sound. In such cases, one does not encounter a sound object, instead, as Schaeffer points out: "there is a perception, an auditory experience, through which I aim at another object" (Schaeffer 1966); these may be called *referential objects* or *indexical objects.*

Reduced listening and *direct listening* invoke different kinds of intentionality. Reduced listening focuses upon the content of an immediate experience. As a result, sound objects are complete; they are filled-out, or fully determined, at the moment of reception. By contrast, referential sounds are schematic, indeterminate entities. Whereas sound objects are 'real' and concretised, referential objects are not; they are mere faithful representations of real objects. As a result, their existence relies heavily upon the intentional acts

of a listener who is required to concretise, or fill-out various indeterminate elements in order to identify the referenced object.

Acousmatic works are not alone in this respect; many art forms are schematic and indeterminate, especially when they represent specific objects and events. Whilst discussing Roman Ingarden's literary philosophy, Peter Simons, makes a very similar point regarding the schematic, indeterminate nature of a text-based narrative:

> A man described in a novel is…not a real man, but something portrayed or represented as a real man. A real man either has or lacks any given property at any given time, but something portrayed as a man is not necessarily portrayed as either having or lacking a given property at a given time: in this respect it is indeterminate. While a fictional character is complete in its properties, it is not complete in the properties it is portrayed as having…It is a necessary consequence of the literary work's linguistic basis that there should be such indeterminacy in its represented objects, which helps us to see why dramatizations of literary works for theatre, cinema and television are so popular: they make the grasping and differentiation of characters very much easier by replacing semantic with intuitive content, gratuitously filling out much of the indeterminacy in a way not even the most imaginative reader could do in a normal reading.
>
> (Simons 1994, pp.4-5)

One could make a very similar point about referential objects in acousmatic music; it is a necessary consequence of the acousmatic work's purely auditory basis that there should be such indeterminacy in its represented objects. Like their literary counterparts, referenced objects in the acousmatic work are not 'real' objects but merely portrayed as such through the use of sound recording and reproduction. Thus, when acousmatic pieces invoke direct listening, they necessarily initiate intentional acts of concretisation from the listener. In other words, the listener becomes an active participant in the process of "concrete artistic cognition (artistic visualisation)" (Bahktin 1981, p.85).

A listener may switch between reduced and direct modes listening. In doing so, he or she is essentially switching between modes of intentionality. Whilst such a switch might be intuitive, it has a fundamental impact upon our experience of both time and space. Sound objects are heard in the moment and

therefore exist at the particular point in time and space in which they are experienced. This does not mean that they lack spatio-temporal features; in most cases, sound objects are rich sources of both spatial and temporal information. Elements such as placement within the stereo image, pitch or spectrum, volume or dynamics, all contribute to our resulting spatial impressions. However, this information is not largely filled-out or concretised by the listener, as with their referential counterparts. Instead, it is largely determined at the moment of reception.

When directly listening to sources and causes, one hears into a different spatio-temporal realm. Like sound objects, referential sounds frequently carry spatio-temporal baggage. However, there is one overriding difference; referential sounds, as discussed above, are indeterminate and, as a result, so are the associated spatio-temporal references. In other words, when engaging in direct listening, spatial references are more likely to be constructed by the individual listener. Such references might depend upon the physical displacement of the sound at the point of recording, cultural associations with the referential sounds or even certain metaphorical associations. However, these are dependent upon the listener recognising them as such, or rather intending towards them in such a way that these features are identified.

This pronounced emphasis upon the listener's intentional acts leads to potential differences of opinion. Listeners sometimes identify objects and events (and therefore spatio-temporal references) that are not intentionally represented in the work. Denis Smalley (1997) refers to our innate attempts to relate the sounds that we hear to things that exist in the real world using the term *source bonding* (Smalley, 1997). He notes that certain bonds might be essential carriers of meaning within a work. However, he also suggests that bonds might be imagined or constructed by the listener. Accordingly, listeners may imagine certain spatial features and, likewise, multiple listeners may have different spatial readings of the work.

Composers frequently play upon such ambiguities by transforming referential sounds to varying degrees, thus creating a sense of mystery or confusion. In such cases, it becomes difficult to unpick which parts are intentional features of the work and which parts are the results of over-zealous

acts of consciousness (and thus created by the listener). It might be assumed that, within a coherent composition, the processed, or non-referential, sounds are contextualised in such a way as to direct the listener in terms of the bondings that are intentional and those which are deliberately open to interpretation. This observation may imply that there is some sort of continuum with referential sounds at the one end and non-referential sounds at the other. However, this is incorrect. At a given moment, one may choose to engage in either reduced listening or direct, natural listening. As a result, acousmatic sound materials are not at either end of a continuum, they (potentially) overlap.

So far, we have identified two spatio-temporal layers, or strata (Ingarden 1973b); those of sound objects and those of referential objects. In both cases, sound materials invoke different sorts of intentional acts which in turn produce different spatio-temporal experiences. However, there is a further layer; both represented objects and sound objects enter into relationships, situations or states of affairs within the context of the work. In doing so, certain *aspects* are revealed. The term *aspects* is borrowed from Ingarden's literary philosophy. However, this (lengthy and complex) concept is more easily understood in the context of traditional representational paintings in which specific objects and events are figuratively depicted; in such cases, the objects and events are necessarily viewed from specific positions and enter into (spatio-temporal) relations with other objects depicted on the canvas; these relationships are *the portrayed aspects* of the painting. One may note that various Modernist traditions have expanded aspectival representation; Cubist paintings frequently portray multiple aspects simultaneously, thus enabling the viewer to see the represented object from multiple angles or viewing positions (thus affecting *the spatial aspectival realm*). In a similar way, the Futurists frequently aimed to depict objects in multiple temporal situations, such as vehicles in motion (thus affecting *the temporal aspectival realm*)[89].

Aspects cannot exist in isolation; they are always aspects-of something, whether referential or otherwise (Simons 1994). Thus, aspects provide objects and spaces with various existential qualities and enable them to enter into

[89] We may note that the layer of aspects is similar to Smalley's notion of perspectival space, which he describes as "the relations of spatial position, movement and scale, viewed from the listener's vantage point" (Smalley 2007).

various relationships and modes of appearance. Aspects, like the represented objects within them, are also schematic indeterminate formations; they require the listener to supplement, or fill-out, their experience imaginatively. In most cases, the layer of aspects is *more* indeterminate than that of represented objects since it most frequently requires the listener to engage in various significant acts of concretisation.

Of course, the listener does not freely imagine aspects. Aspects are shaped according to the various ways in which they are revealed during the work. Roman Ingarden makes a similar point when referring to works of literature, he says:

> Sometimes the work is so suggestive that under its influence the reader succeeds in constructing aspects approximately appropriate to it. Sometimes, however, he involuntarily constructs invented fictitious aspects, which spring not so much from the work as from his own fantasy. And sometimes he fails entirely in this respect and is unable to call forth any aspects whatsoever. He 'sees' nothing of the portrayed object, grasps it only in a purely signitive fashion, and thereby loses the quasi-direct contact with the portrayed world[90].
>
> (Ingarden 1973, p.118)

Acousmatic works, like their literary and pictorial counterparts, frequently contain an aspectival layer in which spatio-temporal relationships are presented. In order to appreciate the significant role that they play in the formation of our spatio-temporal impressions, it is useful to refer to Kendal Walton's (1994) idea that novels and pictures act as *props* in a game of make believe in that the appreciator uses these props to play a role in an imaginary enactment. By extension, we might argue that recognisable, referential sounds serve as metonyms, representing the object of their source and thus acting as "props". In doing so, referential sounds allow the listener's impression of space to develop in line with an imaginary world, or space, in which these sounds are taking place. Multiple referential sounds may suggest the establishment of a coherent

[90] Despite this, his understanding can be adequate in the sense that in reading he attributes to the objects those, and only those, qualities which can be determined by purely linguistic means and which are indicated in the text.

sound-world, or depending upon their various relationships, multiple worlds, or spaces, may appear to exist at a given moment[91].

Once situated within an imaginary space metonymic sounds may serve as "props" with which the listener may generate some form of narrative discourse. An example of this might be Natasha Barrett's *Prince Prospero's Party* (2002) in which representational sounds, such as the clinking of wine glasses, are used firstly to define the space of the imaginary world the listener is inhabiting; the world of the aristocratic ball. Other sounds, such as footsteps, are used to facilitate the generation of narrative within the listener's imagination.

It is not only representational objects that act as props; heavily processed or non-representational sounds are also used. In such cases, the listener may create imaginary worlds or spaces over which the composer has limited control. Walton writes:

> Even if a listener does imagine certain connections among the incidents, these imaginings may strike one as optional, as not mandated especially by the music itself, and so not contributing to a fictional world of the musical work. (They may belong to the world of the listener's imagination, however).
>
> (Walton 1994, p.52)

Thus far, we have outlined three layers in which spatio-temporal impressions begin to form; those of sound objects, those of referential objects and those of aspects. A work may only include one of these layers. However, they may also include elements of all three. All three layers require intentional acts of consciousness on behalf of the listener. Sound objects are already concretised, determinate formations. However, both referential objects and aspects are open to a degree of indeterminacy and are thus filled-out by the active listener."

(Kilpatrick and Stansbie 2011, pp. 55-58)

[91] This idea has certain parallels with Wishart's notion of landscapes (Wishart 2002), as discussed in Section 4.1.2.

Appendix II: A range of Sound Diffusion Systems:

This appendix introduces three of the most famous diffusion systems, including: the Birmingham ElectroAcoustic Sound Theatre (BEAST) (Section II.i), The Acousmonium (Section II.ii) and The Cybernéphone (formerly the Gmebaphone) (Section II.iii).

II.i Birmingham ElectroAcoustic Sound Theatre (BEAST)

The BEAST diffusion system can be adapted to receive an input from numerous different audio sources, such as a CD player, DVD player, a live input or, as is most often the case, a computer programme with acousmatic works pre-loaded. BEAST, like all diffusion systems, has an intermediate control interface that regulates the signal being sent from the audio source to the loudspeakers. However, this particular system uses a purpose-built mixing desk with sets of faders controlling the level being sent to each loudspeaker (Harrison 1999b, p.124). The intermediate control interface regulates the signal being sent to a loudspeaker array which is based upon eight loudspeakers (discussed in Section 2.1) known as the "main eight" (Harrison 1999b, p.121).

The loudspeaker array used in the BEAST system is, in many cases, expanded way beyond the main eight loudspeakers. However, at this stage there is no standard loudspeaker arrangement (although certain arrangements may be commonly found). Instead, the number and position of loudspeakers used within the array will depend upon the concert space that is being used; some spaces require more loudspeakers than others and it is not possible to arrange loudspeakers in a standard format as concert spaces invariably differ in their shape and size. With this in mind, the BEAST system may be adapted to include side speakers in long, thin spaces, additional centre speakers in wide spaces, elevated front/rear speakers to fill lager spaces, distant/close speakers to create the impression of proximity, and so on (Harrison 1999b, pp.122-123).

The BEAST system benefits from various grouping options which enable sets of loudspeakers to be activated with individual faders. These

grouping options are extremely useful when dealing with large number of loudspeakers but invaluable when dealing with multichannel works, since they enable the performer to make smooth and straightforward transitions between various different multichannel rings within the array. In addition to this, the BEAST system offers various pre-set configurations and transitions; whilst these prove to be extremely useful when diffusing works on a large system their use requires a substantial investment of time on the part of the diffuser.

II.ii The Acousmonium

The Acousmonium, a system devised by François Bayle and Jean-Claude Lallemand at the Groupe de Recherches Musicales (GRM), may include up to eighty loudspeakers in a single performance. This system is often referred to as an *orchestra of loudspeakers* in response to the (partially) asymmetrical distribution of non-homogenous loudspeakers resembling the groupings of instruments found in an orchestra. The distinct characteristics of the various loudspeakers are central to the Acousmonium and differentiate this system from certain other systems which have symmetrical, homogenised loudspeakers; for Savouret, this affords a kind of variable shading that other systems do not necessarily permit:

> One notices a certain rejection of the idea of an ensemble of high-fidelity rigorously homogenized loudspeakers, possessing a near-military precision of performance and behaviour in their devotion to the common cause of the composition. To this totalitarian concept of sound-projection, I prefer the high-infidelity of loudspeaker pairs that allow variable shading during the diffusion. To the autism of an ensemble of identical loudspeakers, I prefer the multiracial accents of a disparate gathering.
>
> (Savouret 1998, p.347)

The Acousmonium employs a mixing desk with faders as a control interface. However, given the large number of loudspeakers used in this system, individual faders are often used to control loudspeaker groups (Mooney 2005, p.201).

Thus, by raising individual faders, one is able to activate different sections of the loudspeaker orchestra and thus diffuse the work.

II.iii The Cybernéphone (formerly the Gmebaphone)

Christian Clozier has sought to clearly differentiate the Cybernéphone, formerly called the Gmebaphone, from the Acousmonium; Clozier does not describe his system as a diffusion system or an orchestra of loudspeakers, but as:

> […] a huge acoustic synthesizer, an interpretation instrument that the composer plays in concert, an instrument that serves to express his composition, to enhance its structure for the benefit of the audience, to bring it to sonic concretization.
>
> (Clozier 1998, p.268)

In this context, the term *synthesizer* is used in reference to the Cybernéphone's bespoke frequency splitting device, known as the *Gmebahertz*; this subdivides an encoded audio signal into multiple frequency bands which are then distributed to the loudspeaker array (Emmerson 2008, pp.151-152). The array does not have a standard configuration but typically consists of around fifty loudspeakers with limited frequency response bands; the encoded audio signal is subsequently reproduced by loudspeakers with different frequency responses in different locations, thus: "[...] 'spatializing' it through frequency distribution [...]" (Emmerson 2008, pp.151-152).

The Cybernéphone uses a bespoke mixing desk as an intermediary control interface. However, there are two primary user interfacing modes which Clozier describes as: "manual mode" and "computer-assisted diffusion mode" (Clozier 1998, p.269). In manual mode, the performer has direct control over the signal being sent to a particular loudspeaker via a fader, whereas the computer-assisted mode allows various pre-set fader movements to be triggered during a performance. These pre-sets may be recorded in real-time, directly from the faders, or developed offline using a bespoke interface. Either way, computer-assisted diffusion mode enables the performer to realise highly specific agential acts that would be difficult to realise during a performance.

Appendix III: Composing *for* Performance

The six acousmatic compositions included in the portfolio have been informed by, and have informed, the development of the various ideas presented throughout this thesis. This appendix discusses the six works in turn, aligns the creative process with the development of the theoretical research and demonstrates how an understanding of the ontological nature of the acousmatic musical performance may shape the act of composition. The ideas presented below highlight a range of compositional intentions and motivations, reflect upon acts of performance relative to the various works included in the portfolio and offer a compositional rationale in which performance is situated at the heart of the aesthetic. This appendix may be read in conjunction with Chapter 4.

Isthmus

Isthmus was the first piece composed during this investigation. All of the materials within the piece are based upon recordings of a string quartet; the quartet performed scored fragments and responded to verbal instructions to produce materials that were subsequently processed and transformed in the composition studio. The intention was to establish a meeting point between certain forms of modern instrumental music and forms of acousmatic electroacoustic music, charting a transition from one to the other. More specifically, the intention was to consider corresponding interests with regard to sound spectra and the shaping of spectra over time (as found in works of the Spectralist and New Complexity schools and many forms of electroacoustic music).

The piece was originally intended to be a single movement work. However, the composer had access to a sound diffusion system at several points during the compositional process and was able to trial phrases and fragments in advance; this led to the creation of a three movement form. The source-bonded instrumental recordings were extremely gestural. However, trials revealed a disconnect between those instrumental gestures and associated diffusion gestures; an active diffusion had the (unwanted) effect of rupturing the source-

bondings, which were (and are) central to the aesthetic. It seemed more appropriate to situate the source-bonded sounds at the front of the audience, relative to their assumed real-world positions. Diffusion trials also suggested that it would be difficult to create transitions between source-bonded and non-source-bonded sound materials; the listener retains an impression of source-bonding throughout the piece and, even though the materials themselves may be transformed or disguised, this seemed to impact upon the choice of agential acts, since the performer tended to present all of the sound materials (source-bonded or otherwise) relative to assumed source-bonded spaces. Accordingly, the three movements served to highlight the gradual process of transition from source recordings to processed sounds and aid the performer by leaving gaps in which source-bondings may be forgotten by the listener.

The composer found that performances of the completed piece were more successful in smaller, acoustically treated spaces and less successful in certain larger reverberant spaces; the source-bonded materials communicate information relative to the recording situation and, in larger concert halls, this often created spatial dissonance (discussed in Section 1.3). Spatial dissonance, which may be particularly noticeable in the first movement, is not necessarily encountered throughout the work and was deemed to be problematic.

Performances also revealed something positive; the form of the piece could be further clarified through the use of agential acts. By rooting the source-bonded materials relative to their assumed real-world positions and by employing agential acts to gradually dramatise the non-source-bonded materials, the performer is able to chart the development of the piece and reinforce the transition from recognisable to non-recognisable materials. Despite this, the source-bonded materials did not afford many interpretative opportunities in diffusion and, since the composer was interested in the relationship between composition and performance, this highlighted a need to explore non-source-bonded materials in subsequent works.

Early Morning

In this case, the various sound materials derive from a series of recordings of numerous different pianos. The piano has been largely disguised through the use

of substantial sound transformation (in response to the findings outlined above). Accordingly, the piece is not concerned with source-bonded references but with spectromorphological shapes and behaviours. In particular, it explores Denis Smalley's notion of gesture and texture as forming principles (Smalley 1997). The composer noted that non-source-bonded gestural materials diffuse particularly well, since the performer is able to employ corresponding gestures to further dramatise activities. As discovered during the creation/presentation of *Isthmus*, the performer may use agential acts to reinforce a form of the piece. In this case, the performer may further dramatise gestural materials and spatialise textural materials, since *Early Morning* charts a gradual intensification of gestural activities interspersed with textural interludes.

During performance, the non-source-bonded gestural materials afford a greater range of interpretational opportunities than the source-bonded materials found in *Isthmus;* the performer is much freer to present the spectromorphological behaviours around the listening space and thus explore the specific diffusion system/concert hall that is available. The composer was extremely fortunate to hear a performance of *Early Morning* by Annette Vande Gorne (at L'Espace du Son, Belgium, October 2006; see Appendix V). Vande Gorne's approach to the various gestural materials served to demonstrate a degree of variability that is built in to the piece; a performer may approach the work in numerous different ways, without rupturing or contradicting the overall aesthetic. This suggested a new direction for the investigation, ultimately leading towards a greater understanding of the relationship that holds between works and performance; the latter must afford a degree of variability in the former, and the composer was keen to understand how this is possible and seek to use this possibility as a creative device.

With the above in mind, an investigating the ontological nature of the works and performances was inevitable. The writings of Roman Ingarden (1973a; 1973b; 1986) provided an ideal point of departure, ultimately leading the composer on a path that led to Stephen Davies and the notion of thick and thin works (Davies 2004). Davies' type-theory was clearly developed with scored, instrumental works in mind and he refuses to entertain the idea of *thin* tape works. However, it was clear, given the above discussion, that acousmatic

works *may* be ontologically thinner than their various instances and, to demonstrate this point, the composer decided to create a series of works that explore the notion of thick and thin.

Parenthesis

Parenthesis was conceived as an ontologically *thin* acousmatic work. The various granular, noise-based materials are not source-bonded and are, on the whole, extremely active whilst further exploring the notion of gesture and texture as forming principals. Most of the materials were developed through various performative acts in the composition studio and the use of recognisable sound processes and transformations encourages technological listening. The composer hoped that the use of such materials would afford manifold interpretative options during performance, particularly given the performative nature of the compositional process. As the compositional process developed, it became clear that the intention to create an extremely *thin* work was overshadowing the composer's interest in musical form. Accordingly, various structural points (discussed in Section 4.1.3) were established, ultimately serving to connect and organise the sound-world. These points may be reinforced during performance; the performer may employ specific agential acts each time a structural point is encountered (as discussed in Section 4.1.3).

Parenthesis functions particularly well in a wide range of performance spaces and situations; the performer is able to assimilate their interpretative ideal in accordance with the specific concert venue and is not restricted by source-bonding or broader process functions. A performance with BEAST (Sonic Spatial Perspectives, Leeds Metropolitan University, January 2009) enabled the composer/performer to explore a range of interpretive options that has not been considered during the compositional process. This clarified an idea that was starting to emerge; acousmatic works are schematic, indeterminate formations that are completed during the act of performance in relation to the specific venue, diffusion system and associated contextual affordances and constraints. Thus, at this stage in the investigation, the relationship between acousmatic works and their performances had become clear and could be described in relation to Davies' type-theory.

Point of Departure

After creating an ontologically *thin* acousmatic work, it seemed prudent to compose something that was extremely *thick*; this would enable a further exploration of the work/performance relationship whilst suggesting ways in which performers must deal with thick works during the act of performance. Source-bonded materials had been considered during the creation of *Isthmus*, producing a relatively thick work. Accordingly, this investigation considered whether it was possible to create an extremely thick work using abstract (i.e. non-source-bonded) materials.

The above goal was achieved using a spectral root that underpins much of the first 16 minutes of the piece. The spectral root is omnipresent, suggestive of immersive states and relatively inactive (except for a brief melodic sequence in the middle of the piece). Accordingly, it is suggestive of a relatively inactive diffusion in which the performer surrounds the listener in the ensuing texture for large sections of the piece. Gestural materials were situated (simultaneously and sequentially) alongside the spectral root. However, the performer will struggle to deal with these gestures during the act of performance, since they are heard relative to the spectral root.

The piece received fewer performances than others in the portfolio (possibly due to the 22'04" duration). However, two performances were particularly revealing. Firstly, the diffusion system at MANTIS (MANTIS Spring Festival, University of Manchester, March 2009) presented both a distant and a proximate ring of loudspeakers. These were used to situate the spectral root (and the associated gestural grains) close to the listener at the opening of the piece to create the impression of proximate space. A transition from the proximate ring to the distal ring served to foreground the broad process of accumulation (discussed in Section 4.1.3) and create the impression of distal space. Secondly, a performance at the Bourges Festival (Bourges Festival, IMEB, June 2009) highlighted the value of Christian Clozier's Cybernéphone and, more specifically, the Cybernéphone's bespoke frequency splitting device, known as the *Gmebahertz* (discussed in Appendix II). Very few agential acts were involved in the presentation of the piece. However, the *Gmebahertz* and

the fifty or so loudspeakers with limited frequency response bands, spatialised the work through frequency distribution.

Escapade

After composing thin, thick, source-bonded and non-source-bonded works, it was worth considering whether all of these various materials, techniques and intentions could coalesce within a single piece. Accordingly, *Escapade* presents a broad range of musical materials, is characterised by a slightly more complex global structure and was considered (at least during the act of composition) as both a thick *and* thin work, with different sections of the piece offering a variable range of interpretative options. Further to this, the composer had become much more familiar with a range of different diffusion systems and was now able to consider acts of composition relative to such systems; finding large-scale diffusion systems much more rewarding (both in terms of performing and listening), *Escapade* was composed with large performance systems in mind (it was to be premiered by Annette Vande Gorne on the large diffusion system at L'Espace du Son). Accordingly, broad orchestral gestures were employed as source-sounds, since it was assumed that these will work particularly well on larger system, offering the possibility of creating powerful gestures in the listening space. These were presented alongside very small granular materials to create a clear contrast between micro and macro structures in the work.

Performances of *Escapade* have proved to be the most rewarding (from the point of view of the composer/performer (and hopefully the listener)). The diverse range of sound materials within the piece, the relationship between source-bonded and non-source-bonded sounds and the perspectival shift initiated by both micro and macro forms suggests a welcome range of different agential acts that can showcase various different aspects of a diffusion system whilst also reinforcing the structure of the work.

Fractions

When starting this investigation, multichannel composition was extremely appealing. As the research progressed and the idea of creating *thin* works became apparent, multichannel composition seemed much less appealing; such

works are, on the whole, extremely thick, since they offer the performer relatively few interpretative options. Accordingly, *Fractions* was originally conceived as a *thin* multichannel work (in so far as the idea of multichannel performance interpretation was considered during the compositional process). In order to achieve this, the piece is based upon an exploration of Denis Smalley's notion of space-form (Smalley 2007); whilst the performer cannot necessarily sculpt multichannel gestural materials in the performance space, it *is* possible to expand and contract spatial images across multiple multichannel rings (as discussed in Section 4.1.5).

The finished composition was designed with expressive agential acts in mind. However, performances of the work have (thus far) been limited by contextual constraints (discussed in Section 4.2); none of the diffusion systems have offered more than one multichannel ring and, as a result, the piece has always been played back (with some relatively minor corrective agential acts). The piece was composed in studio 2 at Elektronmusikstudion (EMS); this studio, which is very large, resembles a small concert hall and therefore suits a compositional process that foregrounds both the impression of space and performance. Despite this, the composer has been extremely dissatisfied when listening in smaller studio spaces; many of the spatial images that were clear and coherent in the studio at EMS are destroyed in smaller spaces and, as a result, the spatial form is transformed beyond recognition.

Appendix IV: Compositions/Programme Notes:

IV.i Isthmus

Stereophonic acousmatic work (composed in 2005)

Duration 10'05"

The entire sound-world of Isthmus is derived from solo and ensemble performances of three string instruments: the violin, viola and cello. Transformations in the first movement maintain a close relationship with the timbre and performance techniques of these instruments, extending both natural morphologies and textures, yet often regressing to reveal the source recordings. On these occasions physical spaces, and the performer's position within them, can be identified along with references to Modern and contemporary string music.

Transformations become more complex in the second movement, offering a variety of timbral, rhythmic and sonic interactions, which digress from the original performances. The physical spaces become virtual, and instruments lose their static positions, developing abstract spatial movements. References to the source material become less frequent and transformed sounds establish distinct pulses and morphologies that evolve independently.

As the third movement begins, Isthmus has become a purely virtual space with few references to its source. The title of the piece refers to this progression but suggests that the intimacy of Isthmus is beset at both ends by an immense and impending mass.

Isthmus received *Prix Residence* at the 33rd International Competition of Electroacoustic Music and Sonic Art, Institut International de Musique Electroacoustique de Bourges (IMEB) / Bourges 2006

IV.ii Early Morning

Stereophonic acousmatic work (composed in 2006)

Duration 11'24"

Early Morning is derived from five piano performances recorded in a variety of spaces over a period of several years. These performances incorporated both traditional and extended instrumental techniques, generating a wide variety of gestural and textural materials. Although these materials informed the overall unity of the piece, sound transformations proved to negate the piano as a recognisable source. Instead, the focus is upon the gradual accumulation and dispersal of spectral detail; these broad contours enhance the spatial impression, suggesting the expansive shaping of physical landscapes. The structure of the piece was inspired by the peaceful awakening of an early morning scene and its illumination in first light.

Early Morning received *First Prize* in International Competition of Acousmatic Music "Métamorphoses" (Category A). Musique et Recherches (M&R), Belgium 2006.

IV.iii Parenthesis

Stereophonic acousmatic work (composed in 2008)

Duration 8'54"

In memory of Leon Morahan-Stansbie, 5th August 1973 – 18th August 2004.

The source materials for *Parenthesis* did not have fixed pitches or pitch-centres but were derived from synthetic and recorded noise-based sounds. These were explored through various distortion and granulation processes and shaped into rhythmic pulses and iterations. The piece is concerned with the articulation of energy and speed through the accumulation and dispersal of noise-based phrases and structures and this brief digression from my usual compositional approach inspired my choice of the title.

Parenthesis was composed in Studio Circé at the Institut International de Musique Electroacoustic de Bourges (IMEB), France.

IV.iv Point of Departure

Stereophonic acousmatic work (composed in 2009)

Duration 22'04"

The formal character of *Point of Departure* was largely predetermined, being based upon a single (sonic) shape that has simple geometric features, such as points, lines, planes, curves, and so on. The shape emerges gradually – at the start of the piece disparate micro-sounds slowly gather, eventually fusing to establish a unified spectral mass. Later on, the apparent dimensions of the mass start to fluctuate; defined pitch-centres emerge and spatial boundaries are articulated by shifting spectral contours. Ultimately, I wanted to transcend these boundaries and I spend a considerable time searching for an appropriate point of departure...

Point of Departure was composed in Studio Circé at the Institut International de Musique Electroacoustic de Bourges (IMEB), France.

IV.v Escapade

Stereophonic acousmatic work (composed in 2010)

Duration 9'44"

Escapade was composed using tiny fragments of sound. At the start of the piece, the individual fragments are not perceived. Instead, they are so densely packed that they (perceptually) fuse into much larger structures; one hears the source recordings, which are largely, but not entirely, orchestral. As the piece progresses, the individual fragments become increasingly prominent; they no longer fuse into larger structures and are subsequently perceived as discrete units or entities. In this respect, *Escapade* was inspired by pointillistic painting – a technique in which small, distinct points of colour are used to form a larger image.

Escapade was composed in the studios at Musiques & Recherches, Belgium. I am extremely grateful to Annette Vande Gorne for her hospitality and support.

Escapade received *First Prize* in the Third International Competition of Electroacoustic Composition and Visual Music, Destellos Foundation, Argentina, 2010. It was also a Finalist in the VIII International Competition for Composers "Città di Udine", Italy 2010.

IV.vi Fractions

Multichannel (7.0) acousmatic work (composed in 2011)

Duration 9'10"

Fractions also has a stereophonic version, duration 9'10"

Fractions explores Denis Smalley's notion of *space-form* – an approach to musical form which privileges space as the primary carrier of structural coherence (Smalley 2007). The piece opens with various (frontal) perspectival spaces. These gradually develop outwards, move around the listener, expand into circumspace, and ultimately egocentric space. As with previous works, the various gestural materials become increasingly active as the piece develops before fusing into a dense textural mass. In this case, gestural space transforms into textural space and, although temporality remains significant, this spatial transformation is central to the structure of the finished piece.

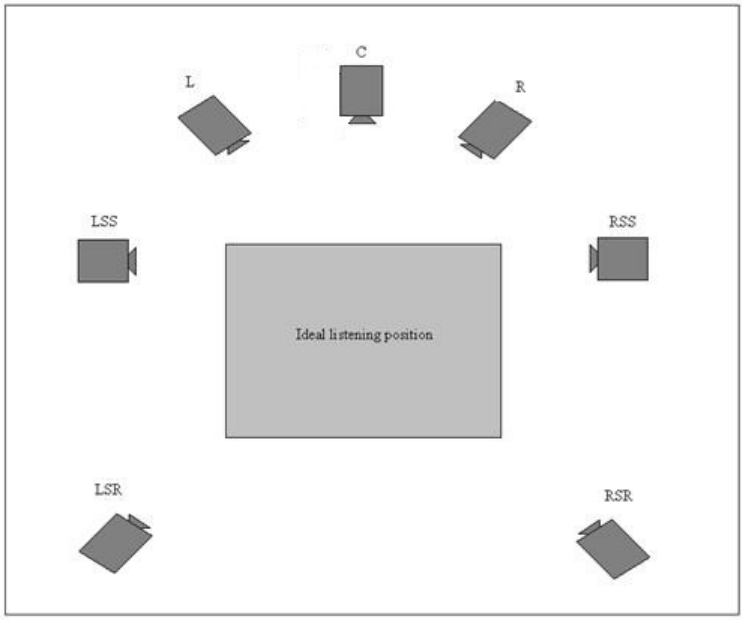
Fractions was composed in 2011 at Leeds College of Music (LCM), UK, and Elektronmusikstudion (EMS), Sweden; the piece would not exist without the generous support of these two institutions.

Fractions is dedicated to Dale Jonathan Perkins (LCM), in recognition of his encouragement, his enthusiasm and his music.

The 7 tracks are labelled as follows:

Fractions C
Fractions L
Fractions R
Fractions LSS
Fractions RSS
Fractions LSR
Fractions RSR

The following diagram shows how the 7 tracks should be mapped to the various loudspeakers (in performance, all of the tracks should be summed and sent to a sub):



Key:
L = Left
R = Right
C = Centre
LSS = Left Surround Side
RSS = Right Surround Side
LSR = Left Surround Rear
RSR = Right Surround Rear

Appendix V: Performances

V.i Isthmus

- Bourges Festival, Bourges, France, June 2007
- Royal Musical Association, Keele, UK, 25th May 2007
- SPNM, Institute of Contemporary Art (ICA), London, UK, April 2007
- EAR-Drum Festival, Dublin, Ireland, March 2007
- Mini-BEAST Concert, Birmingham, UK, 6th December 2006
- City University Concert, London, UK, 24th October 2006
- 11th International Festival of Electro-Acoustic Music, Havana, Cuba, March 2006
- 10th Santa Fe International Electroacoustic Festival, Santa Fe, USA, March 2006
- Royal Musical Association Research Students Conference, Leeds, UK, 4th – 5th January 2006
- City University Concert Series, London, UK, 13th December 2005
- Sound Café, Roxborough, Scotland, 26th November 2005
- York SightSound, York, UK, October 2005
- 404 Festival, Argentina, 2005
- Sonoimagenes, Festival Acousmatica y Multimedia, 23rd – 26th August 2005, Buenos Aires, Argentina
- DMRN Summer Conference 2005, The University of Glasgow, 23rd – 24th July 2005, Glasgow, Scotland
- Rhymer Auditorium, York, UK
- 'Soundworks Live', ArtTrail Soundworks 2005, Cork, European Capital of Culture 2005, Ireland, 29th June 2005

V.ii Early Morning

- The Electroacoustic Project: Festival Oktober 2012, Akademie der bildenden Künste, Vienna, Austria, 6th October 2012
- n.one6, Leeds College of Music, Leeds, 16th May 2008
- Royal Scottish Academy of Music and Drama Concert Series, 10th December 2007
- Soundwaves Festival, Brighton and Hove, 17th – 24th June, 2007
- 11th Santa Fe International Electroacoustic Festival, March 2007
- Echochroma 1, Leeds Metropolitan University, 18th February 2007
- City University Concert Series, UK, 27th January 2007
- EAR-plugged Festival Programme, Dublin, Ireland, 8th – 9th December 2006
- CAVE Festival, Taipei, Taiwan, 25th November 2006
- Electroacoustic Election Day Concert, Highline Community College, Des Moines, USA, November 2006
- 404 Festival, Argentina, November 2006
- L'Espace du Son, Brussels, Belgium, October 2006
- VI Festival Internacional de Música Electroacústica de Santiago, Chile, Ai-maako 2006, October 2006
- Bellingham Electronic Art Festival (BEAF), Bellingham, USA, October, 2006
- Sonic Art Group Meeting, Leeds, UK, 16th September 2006
- Digital Music Research Network (DMRN), Goldsmiths, 22nd – 23rd July 2006
- Epsilonia Festival, France, 4th May 2006

V.iii Parenthesis

- SoundCrawl: Nashville, Nashville, USA, 2nd October 2010
- New Media Fest'2010, Cologne, Germany, 28th June – 4th July 2010
- Music under the Influence of Computers, San Diego, USA, 21st April 2010
- City University Concert Series, London, UK, 16th March 2010.
- UNC CHAT Digital Arts Festival, North Carolina, USA, 16th – 19th February 2010
- Echochroma v, Leeds Metropolitan University, UK, 14th December 2009
- Channel Noise: Electronic Music, Georgia Southern University, Georgia, USA, 1st October 2009
- Sound and Music Expo, Leeds, UK, 26th September 2009
- Scarborough Electroacoustic (SEA), Scarborough, UK, 12th September 2009
- ICMC, Montreal, Canada, 16th – 21st August 2009
- FILE Electronic Language Festival 2009, Sao Paulo/Brazil, 27th July - 30th August 2009
- ICMSN 2009, Listening Room, Keele University, Keele, UK, 2nd – 5th July 2009
- FOCAM, Leeds, UK, 14th May 2009
- SCI, Society of Composers, Inc. 2009, College of Santa Fe, Santa Fe, USA, 2nd – 4th April 2009
- SoundLab VI, Cologne, Germany, March 2009
- ÉuCuE xxvii, Concordia University, Montréal, Canada, 30th January 2009
- Sonic Spatial Perspectives, Leeds Metropolitan University, Leeds, UK, 6th January 2009
- IMMArts, Illinois, USA, 10th November 2008

V.iv Point of Departure

- Echochroma IV, Leeds, Leeds Metropolitan University, 21st February 2010
- EMM, Kansas, USA, 5th – 7th November 2009
- Bourges Festival, IMEB, Bourges, France, 4th June 2009
- n.one-7, Leeds College of Music, Leeds, UK, 1st May 2009
- City University Concert Series, City University, London, UK, 31st March 2009
- MANTIS Spring Festival, University of Manchester, Manchester, UK, 7th March 2009

V.v Escapade

- ISCM World Music Days 2012, British Panel Selection, Belgium, 25th October – 4th November 2012
- Sound Junction 2012, Sheffield University, UK, 9th June 2012
- INTIME2011 Symposium, Coventry University, 23rd – 25th Sept 2011
- Festival Futura 2011, Crest, Drôme, France, 25th – 28th August 2011
- International Computer Music Conference (ICMC) 2011, Huddersfield, UK, 31st July – 5th August 2011
- CONCIERTOS PHONOS 2010-2011, Concierto acusmático, Barcelona, Spain, 8th June 2011
- Image and Resonance, Mar del Plata, Argentina, 2nd June 2011
- N.one9, Leeds College of Music, Leeds, UK, 1st April 2011
- Diffusion Concert, Edge Hill University, UK, 4th March 2011
- Art of Record Production Conference, Leeds Metropolitan University, 3rd – 5th December 2010
- Exploring the acousmatic fabric of space, City University Concert Series, London, UK, 2nd November 2010
- Sunday Night Multimedia Series: "Virtual Playground", Montana State University Department of Music, USA, 10th October 10
- Pixilerations, [v.7], Providence, Rhode Island, 30th September – 10th October, 2010
- Sounding Out 5, Bournemouth, UK, 9th September 2010
- The New Zealand Electroacoustic Music Symposium (NZEMS) 2010, Auckland, New Zealand, 1st September 2010
- Sound Junction, Sheffield University, UK, 30th May 2010
- FOCAM, Leeds University, Leeds, UK, 12th May 2010
- Music under the Influence of Computers, San Diego, USA, 5th May 2010
- Echochroma VI, Leeds Metropolitan University, Leeds, UK, 27th April 2010
- Concert de Creations, Musique et Recherches, Brussels, Belgium, 21st April 2010

V.vi Fractions

- International Computer Music Conference (ICMC), Slovakia, 9th – 15th Sept 2012
- NoiseFloor 2012, Staffordshire University, UK, 4th May 2012
- International Forum for Innovations in Production and Composition (IFIMPaC), Leeds College of Music, Leeds, UK, 26th – 27th April 2012
- Echochroma VIII, Leeds Metropolitan University, Leeds, UK, 26th, November 2011
- FEASt Fest, Miami, USA, 8th November 2011
- City Sounds, Flykingen, Sweden, 26th October 2011
- City Sounds, IDKA, Gävle, Sweden, 25th October 2011

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