1 Introduction

What do I want to do with this book?

In 2007 I wrote an article for *Twentieth-Century Music* with the same title as this monograph, in which I laid out an earlier version of my thoughts and therein lies the rub. Having been involved in the Art of Record Production conference, journal and association for over eight years now, I have observed several problems that others involved in the study of music have been wrestling with. These problems lie broadly in two areas. The first is that, despite the fact that the academic study of music has really developed in tandem with the development of recording and recorded music, it hasn't sufficiently addressed the ontological question of how recording changed music and how that change needs to be incorporated into its study. The second is a broader question and one of which perhaps the first question is a symptom. Why are there such chasms between the studies of different types of music? Why, for example, do popular music scholars so rarely talk to classical music scholars? This seems to be a much deeper problem than for the visual arts or literature, and yet also coincides with a period of unprecedented cross-fertilisation in musical practice.

The first question is really the subtext of the whole book and I'll start to get to grips with that in the next chapter. The second, though, informs my approach to writing this book and, as such, although I hope the detail will emerge as the book progresses, I will lay out some of my thoughts on the subject in this introduction. As for the question of what I'm trying to achieve with this book, although in one sense it is a personal manifesto about an important direction I believe musicology needs to cover, it is also intended as a spur for discussion. In a specific sense I am trying to establish a broad framework for the subject area that combines my ideas about some issues with a survey of how I think other existing work fits within this framework. As Anne Danielsen suggested when she was reading through a draft chapter of the book, it is a meta-text: a book that seeks to elaborate the nature of the academic subject itself rather than one that provides an in-depth analysis of any specific features. By using examples to illuminate some

particular theoretical points it does, of course, enter into that territory, but my primary purpose is to draw a rough large-scale map of the disciplinary landscape and to suggest a strategy for filling in the detail.

In a more general sense, I am aligning myself with what I see as a larger trend in musicology, an agenda that flows out of ideas from psychology and sociology. In psychology, this is the ecological approach to perception and the ideas of embodied cognition. In sociology (and cultural theory) it involves the constructionist approach to the sociology of technology, the systems approach to creativity and other ideas from the sociology of culture and anthropology. I'll expand on these shortly (and throughout the book) but first I should explain something about the structure and organisation of the book.

The structure of the book

The structure of this book has evolved out of three layers of categorisation. The first is concerned with the issue of the dichotomy between production- and reception-based approaches to musical analysis. By analysing the connection between the composer/performer/producer and the audience/listener, I want to examine areas of compatibility between them and the potential for common tools. There is quite a major structural divide within the academic study of music that has its roots in the historical division between what might crudely be described as learning how to do and learning how to listen. On the one hand, musical analysis has tended to be predicated on the idea that the 'text', the object of musical analysis, should be treated as a standalone object. The intentions of the composer or performer, the historical or cultural context in which the work was created, and the influence of the technologies of musical instruments and other aspects of the creative process have, in the ideology of 'pure music', been considered irrelevant, or at least given. The way that the musical text creates meaning is inherent in the music itself. In recent years, the ideology of analysis has shifted to include the historical and cultural context and, for example in historically informed performance practice, the influence of instrument technology. This shift has involved the notion that musical meaning is a result of interpretation and that different listeners will produce different interpretations. These are fundamentally reception-based approaches to musical analysis: they focus on how music produces musical meaning for a listener. The production-based approach that examines the creative

process rather than the creative output lies in a fundamentally different and pragmatic tradition.

In the ideological context of higher education where the status of a subject is related almost directly to its practical applicability, pure mathematics, theoretical physics and philosophy are at the top of the tree, while mechanical engineering, nursing and sports science are at the bottom. This traditional hierarchy is to a certain extent self-perpetuating, in that the inertia in the older, more established and prestigious universities means that they tend to be less concerned with vocational subjects. The more established and prestigious researchers therefore tend not to be attracted to the analysis of the practical creative process. Recently, commercial pressure and the politics of the research impact agenda have started to put pressure on this hierarchy and there have also been certain historical anomalies. For example, research into the process of creating medicines has a higher status than other practical applications of scientific theory. In the academic world of music practice, composition, performance and record production have tended to follow a traditional model of the vocational subject: the teaching of good practice in terms of a framework of rules and guidelines. Some are rules per se and some are rules that are learned so that they can be creatively broken from a position of knowledge. Research in these areas is far less common than on the reception side, and has tended to be about the identification and formulation of these rules and guidelines. Of course, ethnomusicology has been engaged in the study of the processes of music creation in a parallel but largely separate discipline. It is only in recent years that performance studies, the study of the record production process and ethnomusicology have started to infiltrate music departments and to bring the tools of psychology, sociology and anthropology to bear on the creative process. This distinction between the production- and reception- based approaches to analysis exists within the book's structure mostly through the attempt to build bridges between them. Certain chapters cover areas that lend themselves to one approach more than another, and the commentary in Chapters 2 and 3 will make this clear as well as explaining how I intend to reconcile them.

The second layer of structure is the relatively obvious formal process of typology that I've engaged in with my chapter headings. While this introduction and the following two chapters address some of the methodological questions, there follow eight chapters that, I argue, constitute a functional typology of the key issues that need to be addressed if recorded music and record production are to be integrated into musicology. There are, of course, areas of overlap, but this typology has been useful to me in developing my

research ideas and the curriculum for the Master's in Record Production I wrote for the London College of Music, University of West London. This typology is based around an analysis of the agents and activities involved in the production and reception of recorded music. On the reception side I start with two chapters (4 and 5) that deal with the psychology of listening to recorded music, while Chapter 10 deals with the sociology of audience reception and Chapter 11 deals with that halfway house between production and reception: the recording industry. On the production side, Chapter 6 examines the technology: the non-human 'participants' in the recording process. Chapter 7 deals with how humans engage with that technology, and Chapters 8 and 9 examine how the participants on the recording and performance sides work together and interact. I should reiterate, though, that my aim here is not to attempt an explanation of all these phenomena but to lay out a map of how I believe they can be explained and to provide a few examples along the way.

The third layer relates to the way in which the underlying theoretical framework unfolds throughout the book, and the four interludes that intersperse the eight chapters of the typology provide brief explanations and introductions to this. After some initial explanations in this chapter and the following two, Chapters 4 and 5 involve some further expansion of the ideas around ecological perception and embodied cognition. This forms the basis of my ideas about the psychology of listening to recorded music. Chapters 6 and 7 introduce some ways in which actor-network theory (ANT), the social construction of technology (SCOT) and the systems approach to creativity can be applied to various aspects of record production. This allows us to discuss both the technology and the ways in which humans engage with it. Chapters 8 and 9 then start the process of integrating these psychological and sociological approaches from a practice/production perspective. This happens through the prism of the collective creative practice, communication and interaction of the recording process. Chapters 10 and 11 do the same from a reception/audience perspective by discussing the way audiences engage with production on a collective level and the way the business combines the role of fan/audience with that of motivational driver of the production process.

The structure of the book reflects my rather pragmatic philosophy, a recursive idea that my knowledge is schematic and the features I'm interested in determine the schematic representation that I use. Although the eight categories were a decision that predated the book and grew out of the article for *Twentieth-Century Music* (Zagorski-Thomas 2007), the other layers have been an emergent property of the writing process.

Music and reification

Christopher Small's (1998) lasting legacy in both ethnomusicology and performance studies was to coin the term 'musicking' to describe music as a process rather than a thing. I'll explore the relationship between recorded music and business in more depth in Chapter 11, but three fundamental changes in the nature of music have occurred because of the development of technologies that allowed its reification. The development of sheet music publishing made a durable consumer product out of music for the first time. Before then, the only potential for commercial exploitation lay in the ephemera of performance. Sheet music afforded a physical product from the composer's output that could be sold. It was the key driving force that propelled the European art music tradition to privilege composition over performance, and it did this in two ways. First, and most obviously, it provided a vehicle for durability, legacy and the estimation of value through the process of widespread dissemination and the potential to put a numerical or financial value on popularity. But it went further than the comparable simplicity of sales figures. Beyond the boundary of their lifetime their work could continue to sell. Not only could their work live on, but its popularity could be measured. Of course, sales are not the only criterion for assessing a legacy, but if any cultural capital that might accrue from gatekeepers and academics extolling a composer's value is not subsequently reflected in audience approval then it is likely to be short-lived. I'm not suggesting that an assessment of whether Bach is superior to Mozart or Beethoven should be made on cumulative sheet music sales, just that it is unthinkable that a composer who was lauded as great could retain that position as a legacy without widespread dissemination.

The second way in which sheet music led to the privileging of composition over performance was that it provided a mechanism for the analysis of composition that wasn't available in relation to performance. This provided composers with a way of representing the rules of composition in a much more straightforward manner than was possible for performance. That representation also allowed those rules to be extended, altered and expanded in a much more systematic manner than those of performance. Further to that, it led to the academic study of the score becoming a cipher for the study of music.

The next technological change that led to a fundamental shift in the nature of music was the development of recording. The wax cylinder, disc, tape and CD provided a century-long range of technologies that allowed a similar process of reification for performance that sheet music provided for

composition. Nellie Melba, Ella Fitzgerald and Elvis Presley have a legacy as performers in a way that Adriana Ferrarese, Hans von Bülow and Jenny Hill[1] can never have because they were never recorded. The analysis of recordings has had a similar effect on performance practice to that the analysis of scores had on composition, particularly in jazz and popular music styles. Practitioners have used the detail of their heroes' recorded performances as a starting point for learning to play and improvise, and this has led to a similar extension, alteration and expansion of the rules of performance practice.

The last of these technological changes is the shift from recorded music as hardware to software: from a physical product to a digital file. Of course the main way that this change is discussed is in relation to economics and distribution: the revolution in the market for recorded music. Equally important, though, is the fact that recorded sound has become something that consumers can manipulate themselves. While the physical product of music embodied in a disc or CD allowed repeated plays, the digital audio file allows a further level of analysis that affords the visual representation of recorded sound. I can see the amplitude, dynamics and frequency spectrum of an audio file as easily as I can see melody and harmony on sheet music. This kind of representational system will surely lead to as significant a change in the way we think about music as the development of musical notation did. Not only does it afford these new types of visual representation, it also affords an expansion in both the scope and availability of audio processing. Not only can the consumer have access to the types of audio processing that were previously only available to the semi-professional and professional sound engineer, there are also an increasing number of new techniques for processing being developed all the time.

These forms of reification also point to another key theme in this book that I will expand upon in Chapter 4: the nature of recorded music. I argue that recorded music is as different from live performance as photography, film and even painting are from the objects they seek to represent. Indeed, representation is the key word for me. Recorded music is a representational form of art. It may be the result of Small's (1998) process of musicking, but what is produced is a schematic representation of some real or constructed performance. The representation may be relatively realistic, like a photograph or an unedited section of a film, but the 'two-dimensional' nature

[1] Adriana Ferrarese was a famous eighteenth-century soprano who sang in Mozart operas at the Burgtheater in Vienna. Hans von Bülow was a nineteenth-century German conductor and pianist and Jenny Hill was a nineteenth-century British music hall performer.

of recorded music will ensure that we can tell the difference between the representation and the 'real thing'. Of course, the representation need not be realistic, like an edited film where close-ups tell us where to focus our intention. We may, for example, mix a whispering voice to be louder than a drum kit in a recorded song.

How music works

Earlier in this chapter I suggested that this book is a personal manifesto about the direction I believe musicology needs to be taking. Defining that direction has to be based on an ideological position about the nature of music and the process of music-making. I say it is an ideological position because I believe it is a case of the evidence suggesting rather than proving anything about the neurology, psychology or sociology of music. I'm therefore going to start with an outline of how I see ecological perception and embodied cognition relating to the interpretation of music. This is intended as a brief overview so that the flow of the book isn't interrupted by having to systematically elaborate these ideas as they crop up in various chapters.

Ecological perception

The ecological approach to perception was developed by James Gibson (1979) and has been applied to music by Eric Clarke (2005), among others. The foundation of this approach is that perception emerges from a system comprising both an animal and its environment. The properties of the physical and cultural environment produce a richness of perceptual data that can produce direct forms of interpretation that don't require the kinds of mediating cognitive activity required by other theories of perception and cognition. Particular rich patterns of stimulation such as optical flow (the rate of change of size and shape of light patterns on the retina) produce direct forms of interpretation. For example, the way light reflects off objects in the environment means that forward locomotion, either by the animal or by an object in the environment, generates a pattern of expansion on the retina. When I move towards a rock or it moves towards me, the particular pattern of light that is reflected off it will get larger on my retina. I don't need to know about rocks or even travelling to develop a mental connection between this type of optical flow and the painful sensation of something hard hitting my face. The connectionist approach to perceptual learning (Clarke 2005, pp. 22–32) suggests that patterns of stimulation and action

that are encountered frequently become entrained into the structure of the brain. This is not a form of learning in the cognitive sense of creating a mental representation of some aspect of the world that includes logical and causal connections: it is about the creation of a frequently trodden pathway in the brain, which includes the expectation about how a particular pattern of stimulation might continue and what it normally leads to, including bodily action.

As the physical experiences that lead to the creation of these well-trodden pathways are not exactly the same each time, the process is based on the identification of certain aspects of experience that remain the same while the details may differ. Gibson calls these 'invariant properties' (1979, pp. 310–12). The connectionist approach to perceptual learning would involve the brain activity associated with these invariant aspects of experience being reinforced as pathways with repeated experiences, while the detail that differs each time would not be reinforced. This, for me, is the basis for the schematic nature of mental representations: certain common features are established as invariant properties of different categories of events or objects through the reinforcement of certain paths and the revealed irrelevance (non-reinforcement) of others. Thus, the relative pitch differences within a scale might become established as invariant properties, while the vocal or instrumental timbre, absolute pitch and rhythmic pattern may vary. The idea that perception and action cannot be separated and that the connectionist structures of invariant properties that become entrained in the brain involve both the stimulus and the bodily responses leads to another crucial idea in Gibson's work: 'affordances'. Put simply, an affordance is the potential for future activity that perception suggests. The frequently trodden pathways of perception are associated with and lead to previous forms of activity (affordances) that may or may not be followed. Stoffregen and Bardy (2001) have suggested that the perception of invariants and affordances happens at a global level rather than within the individual modal systems (vision, audition, touch, etc). Under this system the structures of perceptual learning would be multi-modal.[2] The sound of a drum being hit would be part of a mental structure that also involved an invariant visual pattern of a hitting gesture and, bringing us neatly to the notion of embodied cognition, to the sensorimotor experience of performing a hitting gesture.

[2] See also Tagg's notion of composite anaphones for a different perspective on multi-modal perception through his prism of semiotics (2012, pp. 509–13).

Embodied cognition

George Lakoff and Mark Johnson have, in a series of books (Lakoff 1990; Lakoff and Johnson 1999 and 2003), been at the forefront of the development of the notion of embodied cognition. One of their key concepts is the 'image schema'. This is a schematic representation of a familiar, repeatedly experienced activity. For me there is a very clear mapping between this and the structures of perceptual learning that I've just been discussing in relation to ecological perception. Johnson and Rohrer have characterised the image schema as:

1. recurrent patterns of bodily experience;
2. 'image'-like, in that they preserve the topological structure of the perceptual whole, as evidenced by pattern-completion;
3. operating dynamically in and across time;
4. realized as activation patterns (or 'contours') in and between topologic neural maps;
5. structures which link sensorimotor experience to conceptualization and language;
6. structures which afford 'normal' pattern completions that can serve as a basis for inference.

(2007, p. 30)

Both Lakoff and Johnson and others have developed extensive lists of image schemata that range from containment to axis balance and from full–empty to part–whole. Many of these imply the next step that is referred to in points 5 and 6 of Johnson and Rohrer's list: the creation of metaphorical relationships between our bodily experience and phenomena we perceive in our environment. Rohrer has examined the neurological evidence for image schemata and outlines the following example in relation to the image schema for grasping an object:

> When one monkey observes another monkey perform a grasping task with their hands, the mirror neurons will activate the motor-planning regions in the monkey's own hand cortex . . . experience in one modality must cross over into another. In this example, the visual perception of grasping crosses into the somatomotor cortices, activating the same sensorimotor schemata that would be activated by the monkey grasping something on its own . . . The monkey needs only experience a small portion of the motor movement to complete the entire plan . . . Such patterns can serve to integrate sensory input across modalities; a monkey's grasping mirror neurons can fire, for instance, when the monkey hears a sound correlated with the grasping motion, such as tearing open a package. This suggests that even when

triggered from another modality, the brain tends to complete the entire perceptual contour of an image schema . . .

The perceptual and motor imagery performed by certain regions of the brain subserve at least some processes of language comprehension: we understand an action sentence because we are subconsciously imagining performing the action. (2005, pp. 170–2)

How then does this relate to the perception and interpretation of music? I'm going to return to my example of the sound of a drum and the image schema of hitting that it is associated with. The richness of the information that is encoded in a sound like that provides much more information than the simple fact of a hitting gesture. My past experience of things being hit in the world, whether by myself or by others, will allow me to glean a lot of contextual information. What kind of object is being hit in terms of size, shape, the materials it might be made of, etc? Is it being hit with a hand or with an implement of some kind? How close to or far from me is the hitting taking place, and in what kind of environment? What kind of energy is being expended in the hitting process?

Cross-domain mapping

This brings me back to the idea of metaphor, but more generally to the notion of cross-domain mapping. Fauconnier and Turner (2003) describe conceptual blending – the mapping of features from two mental spaces onto a third, blended space – as fundamental to the way we think. Hearing a particular type of snare drum playing a march rhythm might suggest a blend between the musical content of a track like 'Travelin' Soldier' (Dixie Chicks 2002) and the military theme of the lyrics. The death of the soldier mentioned in the lyrics and the military snare rhythm of the outro evoke a blended space that combines the military theme with a funeral march. However, this high-level interpretation is built upon a whole sequence of more basic mappings between the sound of the drum and various other domains that contribute to our interpretation. Although few of us would know that the sound of a military snare drum is characterised by a second set of metal snares on the underside of the top skin as well as one on the bottom skin, the metallic sound and the lack of resonance will be familiar to many. In addition, the feeling of distance and space in the outro changes from the more intimate space of the song to a more public and formal distance for the ending. This simple trope of transporting the song to a different space and adjusting our positional relationship to it is achieved through our intimate